

C  
M66uZph  
1911/12

UNIVERSITY OF ILLINOIS LIBRARY

JAN 14 1919

**The  
University of Minnesota  
Bulletin**

---

**College of Pharmacy**

---

**1911-1912**



**Volume XIV**

**February 1911**

**No. 1**

---

Entered at the Postoffice  
in Minneapolis as second-class matter  
MINNEAPOLIS, MINN.

The University catalogues are published by authority of the Board of Regents, as a regular series of bulletins. One bulletin for each college is published every year and in addition a bulletin of general information outlining the entrance requirements of all colleges of the University, and embodying such items as University equipment, organizations and publications, expenses of students, loan and trust funds, scholarships, prizes, etc. Bulletins will be sent gratuitously, postage paid, to all persons who apply for them. In calling for bulletins, the college or school of the University concerning which information is desired should be stated. Address,

THE REGISTRAR,

The University of Minnesota,

Minneapolis, Minnesota.

# CALENDAR FOR 1911-1912

1911

1912

## JULY

| S. | M. | T. | W. | T. | F. | S. |
|----|----|----|----|----|----|----|
| .. | .. | .. | .. | .. | .. | 1  |
| 2  | 3  | 4  | 5  | 6  | 7  | 8  |
| 9  | 10 | 11 | 12 | 13 | 14 | 15 |
| 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| 30 | 31 | .. | .. | .. | .. | .. |

## AUGUST

|    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|
| .. | .. | 1  | 2  | 3  | 4  | 5  |
| 6  | 7  | 8  | 9  | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 27 | 28 | 29 | 30 | 31 | .. | .. |
| .. | .. | .. | .. | .. | .. | .. |

## SEPTEMBER

|    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|
| .. | .. | .. | .. | .. | 1  | 2  |
| 3  | 4  | 5  | 6  | 7  | 8  | 9  |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| .. | .. | .. | .. | .. | .. | .. |

## OCTOBER

|    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  |
| 8  | 9  | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 | 31 | .. | .. | .. | .. |
| .. | .. | .. | .. | .. | .. | .. |

## NOVEMBER

|    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|
| .. | .. | .. | 1  | 2  | 3  | 4  |
| 5  | 6  | 7  | 8  | 9  | 10 | 11 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 26 | 27 | 28 | 29 | 30 | .. | .. |
| .. | .. | .. | .. | .. | .. | .. |

## DECEMBER

|    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|
| .. | .. | .. | .. | .. | 1  | 2  |
| 3  | 4  | 5  | 6  | 7  | 8  | 9  |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | .. | .. | .. | .. | .. | .. |

## JANUARY

| S. | M. | T. | W. | T. | F. | S. |
|----|----|----|----|----|----|----|
| .. | 1  | 2  | 3  | 4  | 5  | 6  |
| 7  | 8  | 9  | 10 | 11 | 12 | 13 |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| 28 | 29 | 30 | 31 | .. | .. | .. |
| .. | .. | .. | .. | .. | .. | .. |

## FEBRUARY

|    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|
| .. | .. | .. | .. | 1  | 2  | 3  |
| 4  | 5  | 6  | 7  | 8  | 9  | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | .. | .. |
| .. | .. | .. | .. | .. | .. | .. |

## MARCH

|    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|
| .. | .. | .. | .. | .. | 1  | 2  |
| 3  | 4  | 5  | 6  | 7  | 8  | 9  |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | .. | .. | .. | .. | .. | .. |

## APRIL

|    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|
| .. | 1  | 2  | 3  | 4  | 5  | 6  |
| 7  | 8  | 9  | 10 | 11 | 12 | 13 |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| 28 | 29 | 30 | .. | .. | .. | .. |
| .. | .. | .. | .. | .. | .. | .. |

## MAY

|    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|
| .. | .. | .. | 1  | 2  | 3  | 4  |
| 5  | 6  | 7  | 8  | 9  | 10 | 11 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 26 | 27 | 28 | 29 | 30 | 31 | .. |
| .. | .. | .. | .. | .. | .. | .. |

## JUNE

|    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|
| .. | .. | .. | .. | .. | .. | 1  |
| 2  | 3  | 4  | 5  | 6  | 7  | 8  |
| 9  | 10 | 11 | 12 | 13 | 14 | 15 |
| 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| 30 | .. | .. | .. | .. | .. | .. |



# University Calendar

1911-1912

## THE UNIVERSITY YEAR

The University year covers a period of thirty-eight weeks, beginning on the second Tuesday in September. Commencement Day is always the second Thursday in June.

1911

|           |       |           |                                                                  |
|-----------|-------|-----------|------------------------------------------------------------------|
| September | 5     | Tuesday   | Registration closes except for new students                      |
| Sept.     | 5-12  | Week      | Fees payable except for new students                             |
| Sept.     | 12-18 | Week      | Entrance examinations, freshman registration and payment of fees |
| Sept.     | 13-19 | Week      | Military encampment of cadets                                    |
| September | 15    | Friday    | Condition examinations                                           |
| September | 20    | Wednesday | First semester begins                                            |
| September | 26    | Monday    | University Council meeting                                       |
| October   | 5     | Thursday  | Board of Regents meeting                                         |
| October   | 2     | Monday    | School of Agriculture session begins                             |
| November  | 17    | Friday    | Second quarter begins                                            |
| November  | 29    | Wednesday | Thanksgiving recess begins 5:40 P. M.                            |
| December  | 4     | Monday    | Thanksgiving recess ends 8:30 A. M.                              |
| December  | 4     | Monday    | University Council meeting                                       |
| December  | 12    | Tuesday   | Board of Regents meeting                                         |
| December  | 22    | Friday    | Christmas vacation begins 5:40 P. M.                             |

1912

|          |    |           |                                            |
|----------|----|-----------|--------------------------------------------|
| January  | 9  | Tuesday   | Christmas vacation ends 8:30 A. M.         |
| January  | 23 | Tuesday   | Registration for second semester closes    |
| January  | 29 | Monday    | Final examinations begin                   |
| January  | 30 | Tuesday   | Payment of fees for second semester closes |
| February | 7  | Wednesday | Second semester begins                     |
| February | 12 | Monday    | Lincoln's Birthday: holiday                |
| February | 17 | Saturday  | First semester class reports due           |
| February | 22 | Thursday  | Washington's Birthday: holiday             |
| March    | 27 | Wednesday | School of Agriculture closes               |
| March    | 30 | Saturday  | Easter recess begins 5:40 P. M.            |
| April    | 8  | Monday    | Easter recess ends 8:30 A. M.              |
| April    | 16 | Tuesday   | Fourth quarter begins                      |
| April    | 22 | Monday    | University Council meeting                 |
| May      | 2  | Thursday  | Board of Regents meeting                   |
| May      | 23 | Thursday  | Final examinations begin                   |
| May      | 30 | Thursday  | Decoration Day: holiday                    |
| June     | 8  | Saturday  | Second semester closes                     |

|      |    |           |                              |
|------|----|-----------|------------------------------|
| June | 9  | Sunday    | Baccalaureate service        |
| June | 10 | Monday    | Senior class day exercises   |
| June | 11 | Tuesday   | Phi Beta Kappa address       |
| June | 12 | Wednesday | Alumni Day                   |
| June | 13 | Thursday  | Fortieth Annual Commencement |
| June | 14 | Friday    | Summer vacation begins       |

The University year for 1912-13 will begin Monday, September 10

#### PROGRAM OF ENTRANCE EXAMINATIONS

1911-12

Entrance examinations for admission to the various colleges of the University will be conducted according to the following schedule, in Room 205, Library Building.

Any student finding a conflict in his program should report to the Registrar for adjustment.

|              |           |         |                                                                                |
|--------------|-----------|---------|--------------------------------------------------------------------------------|
| September 12 | Tuesday   | 9 A. M. | Astronomy<br>Botany<br>Geology<br>Chemistry<br>Physiography<br>Zoology         |
|              |           | 2 P. M. | American Government<br>History<br>Economics<br>Physics<br>Commercial Geography |
| September 13 | Wednesday | 9 A. M. | English                                                                        |
|              |           | 2 P. M. | German<br>French<br>Latin<br>Scandinavian                                      |
| September 14 | Thursday  | 9 A. M. | Elementary Algebra                                                             |
|              |           | 2 P. M. | Higher Algebra                                                                 |
| September 15 | Friday    | 9 A. M. | Plane Geometry                                                                 |
|              |           | 2 P. M. | Solid Geometry                                                                 |

# The University

---

THE UNIVERSITY OF MINNESOTA comprises the following named schools  
colleges, and departments:

THE COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

THE COLLEGE OF ENGINEERING AND THE MECHANIC ARTS

THE DEPARTMENT OF AGRICULTURE, including—

THE COLLEGE OF AGRICULTURE

THE COLLEGE OF FORESTRY

THE SCHOOL OF AGRICULTURE

THE DAIRY SCHOOL

THE SHORT COURSE FOR FARMERS

THE SHORT COURSE FOR TEACHERS

THE SCHOOL OF TRACTION ENGINEERING

THE SCHOOL OF AGRICULTURE, CROOKSTON

THE SCHOOL OF AGRICULTURE, MORRIS

THE EXPERIMENT STATIONS, including—

THE MAIN STATION AT ST. ANTHONY PARK

THE SUB-STATION AT CROOKSTON

THE SUB-STATION AT GRAND RAPIDS

THE COLLEGE OF LAW

THE COLLEGE OF MEDICINE AND SURGERY, including—

THE TRAINING SCHOOL FOR NURSES

THE COLLEGE OF DENTISTRY

THE COLLEGE OF PHARMACY

THE SCHOOL OF MINES

THE SCHOOL OF ANALYTICAL AND APPLIED CHEMISTRY

THE COLLEGE OF EDUCATION

THE GRADUATE SCHOOL

---

THE GEOLOGICAL AND NATURAL HISTORY SURVEY

---

Bulletins of these schools, colleges, and departments may be obtained  
upon application to the University Registrar

## The Board of Regents

---

|                                                       |                   |
|-------------------------------------------------------|-------------------|
| CYRUS NORTHROP, LL. D., MINNEAPOLIS                   | <i>Ex-Officio</i> |
| The President of the University (Until April 1, 1911) |                   |
| GEORGE EDGAR VINCENT, Ph. D., MINNEAPOLIS             | <i>Ex-Officio</i> |
| The President of the University (After April 1, 1911) |                   |
| The HON. JOHN LIND, MINNEAPOLIS                       | 1914              |
| The President of the Board                            |                   |
| The HON. ADOLPH O. EBERHART, MANKATO                  | <i>Ex-Officio</i> |
| The Governor of the State                             |                   |
| The HON. C. G. SCHULZ, ST. PAUL                       | <i>Ex-Officio</i> |
| The State Superintendent of Public Instruction        |                   |
| The HON. W. J. MAYO, ROCHESTER                        | 1913              |
| The HON. MILTON M. WILLIAMS, LITTLE FALLS             | 1913              |
| The HON. HENRY B. HOVLAND, DULUTH                     | 1914              |
| The HON. A. E. RICE, WILLMAR                          | 1915              |
| The HON. CHARLES L. SOMMERS, ST. PAUL                 | 1915              |
| The HON. B. F. NELSON, MINNEAPOLIS                    | 1916              |
| The HON. PIERCE BUTLER, ST. PAUL                      | 1916              |
| The HON. CHARLES A. SMITH, MINNEAPOLIS                | 1916              |

---

C. D. DECKER, MINNEAPOLIS,  
Secretary of the Board.

## Executive Officers

---

### THE UNIVERSITY

CYRUS NORTHROP, LL. D., PRESIDENT  
(Until April 1, 1911)

GEORGE EDGAR VINCENT, Ph. D., PRESIDENT  
(After April 1, 1911)

ERNEST B. PIERCE, B. A., REGISTRAR

JAMES T. GEROULD, B. A., LIBRARIAN

C. D. DECKER, PURCHASING AGENT

J. D. BREN, TREASURER

### THE COLLEGES

JOHN F. DOWNEY, M. A., C. E., DEAN OF THE COLLEGE OF SCIENCE,  
LITERATURE, AND THE ARTS

FRANCIS C. SHENEHON, C. E., DEAN OF THE COLLEGE OF ENGINEER-  
ING AND THE MECHANIC ARTS

ALBERT F. WOODS, M. A., DEAN AND DIRECTOR OF THE DEPARTMENT  
OF AGRICULTURE

WILLIAM S. PATTEE, LL. D., DEAN OF THE COLLEGE OF LAW

FRANK FAIRCHILD WESBROOK, M. A., M. D., C. M., DEAN OF THE  
COLLEGE OF MEDICINE AND SURGERY

ALFRED OWRE, B. A., M. D., C. M., D. M. D., DEAN OF THE COLLEGE  
OF DENTISTRY

FREDERICK J. WULLING, Phm. D., LL. M., DEAN OF THE COLLEGE  
OF PHARMACY

WILLIAM R. APPLEBY, M. A., DEAN OF THE SCHOOL OF MINES

GEORGE B. FRANKFORTER, M. A., Ph. D., DEAN OF THE SCHOOL  
OF CHEMISTRY

GEORGE F. JAMES, Ph. D., DEAN OF THE COLLEGE OF EDUCATION

HENRY T. EDDY, C. E., Ph. D., LL. D., DEAN OF THE GRADUATE  
SCHOOL

ADA L. COMSTOCK, M. A., DEAN OF WOMEN



# The University Council

---

At the regular meeting of the Board of Regents of the University May 31, 1905, a University Council was established according to the following plan:

I. The name of the body shall be the University Council. It shall consist of the President of the University, the Deans of the various colleges and schools, one elected representative from each college or school for each 400 students or major fraction thereof, and one representative of the General Alumni Association.

II. The elected members shall serve for a period of one year. They shall be chosen from the various faculties at the time of the selection of standing committees. The representative of the General Alumni Association shall be chosen by that body at its annual meeting from among the alumni who are not members of the University.

III. The Council shall be authorized to—

a) Appoint the following committees or the faculty representation thereon:

The University auditing committee

The University press committee

The committee on athletics

The committee on University relations to other institutions of higher learning

The committee on health and sanitation

The committee on commencement and other University functions

The committee on catalogue, programs and courses of study

The committee on student entertainments and social affairs

And such other committees as the general University interests may require

b) Receive reports from such committees and to make such recommendations as may be required

c) Consider and act upon any matter of general University interest beyond the province of a single faculty which may be referred to it by the President of the University or any Faculty.

IV. The Council shall hold stated meetings upon the first Monday of October, December, April, and June, and such other meetings as the President of the University may call.

# Representatives to the Council

---

## The University

CYRUS NORTHROP, PRESIDENT

(Until April 1, 1911)

GEORGE EDGAR VINCENT, PRESIDENT

(After April 1, 1911)

## The College of Science, Literature, and the Arts

DEAN JOHN F. DOWNEY

PROFESSOR H. F. NACHTRIEB

PROFESSOR J. C. HUTCHINSON

PROFESSOR CARL SCHLENKER

PROFESSOR NORMAN WILDE

## The College of Engineering and the Mechanic Arts

DEAN FRANCIS C. SHENEHON

PROFESSOR GEORGE D. SHEPARDSON

## The College and School of Agriculture

DEAN ALBERT F. WOODS

PROFESSOR JOHN T. STEWART

PROFESSOR EDWARD M. FREEMAN

## The College of Law

DEAN WILLIAM S. PATTEE

PROFESSOR HENRY J. FLETCHER

## The College of Medicine and Surgery

DEAN F. F. WESBROOK

PROFESSOR THOMAS G. LEE

## The College of Dentistry

DEAN ALFRED OWRE

PROFESSOR RICHARD OLDING BEARD

## The College of Pharmacy

DEAN FREDERICK JOHN WULLING

## The School of Mines

DEAN WILLIAM R. APPLEBY

## The School of Chemistry

DEAN GEORGE B. FRANKFORTER

## The College of Education

DEAN GEORGE F. JAMES

## The Graduate School

DEAN HENRY T. EDDY

## The Dean of Women

ADA L. COMSTOCK

## The University Library

JAMES T. GEROULD

## The General Alumni Association

DAVID P. JONES

# University Council Committees

---

## **The University Auditing Committee**

PROFESSORS SIGERFOOS, FLETCHER, MITCHELL, STEWART

## **The Committee on Athletics**

PROFESSORS PAIGE, HARDING, D. P. JONES, LITZENBERG, ROBINSON

## **The Committee on Grounds and Sanitation**

PROFESSORS WESBROOK, BASS, SHENEHON, FLATHER, FRANKFORTER, WOODS, CLEMENTS

## **The Press Committee**

PROFESSORS THOMAS, BEACH, JOHN ZELENY, BAUER, MINER

## **The Committee on Commencement and other University Functions**

PROFESSORS NACHTRIEB, BUTTS, JAMES, SCHLENKER, DR. SCOTT WILDE, WASHBURN, OWRE, SCOTT

## **The Committee on Student Entertainments and Social Affairs**

PROFESSORS PIKE, COMSTOCK, COOKE, BUTTS, SIDENER, FREEMAN, FORD

## **The Committee on University Relations to other Institutions of Higher Learning**

PROFESSORS DOWNEY, BOTHNE, EDDY, JAMES, LEE, APPLEBY, WOODS, SHEPARDSON, HUTCHINSON

## **The Committee on University Extension and University Lectures**

PROFESSORS JAMES, GRAY, HAECKER, JENKS, WULLING, BURTON, JOHNSTON

## **The Committee on the Library**

PROFESSORS EDDY, FLETCHER, GEROULD, REYNOLDS, SHENEHON, VAN BARNEVELD, WHITE, CRAIG, MULLIN

## The Department of Medicine

---

The Department of Medicine includes the following colleges:

The College of Medicine and Surgery

FRANK F. WESBROOK, M.D., C. M., Dean.

THOMAS G. LEE, B.S., M.D., Secretary and Librarian, Department of Medicine.

The College of Dentistry

ALFRED OWRE, A. B., M. D., C. M., D. M. D., Dean.

The College of Pharmacy

FREDERICK J. WULLING, Phm.D., LL.M., Dean.

Each college is self-governed as to its internal affairs, having its own faculty and an independent curriculum. The laboratories and staff of the College of Medicine and Surgery provide instruction for all students in each of the three colleges, as required, in the following branches:

Gross and microscopic anatomy, physiology, chemistry, pathology, bacteriology, and pharmacology.



# The College of Pharmacy

## FACULTY

CYRUS NORTHROP, LL. D., President (Until April 1, 1911)

GEORGE EDGAR VINCENT, Ph. D., President (After April 1, 1911)

FREDERICK J. WULLING, Phm. D., LL. M., etc., Dean, Professor of Pharmacology

---

RICHARD OLDING BEARD, M. D., Professor of Physiology

CHAS. F. SIDENER, B. S., Professor of Quantitative Chemistry

GEORGE B. FRANKFORTER, M. A., Professor of Chemistry

FRANK F. WESBROOK, M. A., M. D., C. M., Professor of Bacteriology

EVERHART P. HARDING, M. S., Ph. D., Assistant Professor of Chemistry

M. R. WILCOX, M. D., Assistant Professor of Physiology

IRA HARRIS DERBY, Ph. D., Assistant Professor of Chemistry

FREDERIC E. CLEMENTS, Ph. D., Professor of Botany

E. D. BROWN, Pharm. D., M. D., Professor of Materia Medica and Therapeutics

.....Professor of Pharmacognosy

MATHIAS SUNDT, A. B., M. D., Assistant Professor of Bacteriology

FREDERIC K. BUTTERS, M. S., Assistant Professor of Botany

F. H. SCOTT, M. D., Assistant Professor of Physiology

GUSTAV BACHMAN, Phm. D., Phm. M., Instructor in Pharmacy

OSCAR BLOSMO, Ph. C., Assistant in Pharmacy

EDWARD FIDLAR, B. A., M. B., Demonstrator in Bacteriology

FRANK F. GROUT, B. S., Instructor in Mineralogy

JOHN A. HANDY, Ph. C., Instructor in Chemistry

JOHN ELDON HYNES, Ph. C., Assistant in Clinical Microscopy

C. N. MCCLOUD, Phm. D., Lecturer on First Aids to the Injured

ALICE MISZ, M. A., Instructor in Botany

EDWIN L. NEWCOMB, P. D., Instructor in Pharmaceutical Botany and Pharmacognosy

H. E. ROBERTSON, M. D., Instructor in Clinical Microscopy

F. W. SCHLUTZ, M. D., Instructor in Physiological Chemistry

J. P. SEDGWICK, B. S., M. D., Instructor in Physiological Chemistry

W. D. SHELDON, M. D., Instructor in Therapeutics

.....Instructor in Pharmaceutical Latin

.....Assistant in Materia Medica

.....Assistant in Pharmacognosy

## SPECIAL LECTURERS

|                 |              |                |
|-----------------|--------------|----------------|
| W. A. FROST     | J. N. KIRBY  | A. D. THOMPSON |
| STEWART GAMBLE  | A. J. KLINE  | E. A. TUPPER   |
| J. W. HARRAH    | C. B. MCCALL | THOMAS VOEGELI |
| CHARLES H. HUHN | HENRY MCCOLL |                |

## ADMISSION

## A—TO THE TWO-YEAR COURSE

While nearly all the students enrolled in this college are graduates of full four-year high school courses, such a training prior to entrance is not obligatory at the present time. The requirements, however, are being raised gradually in such a way that soon they shall be a full high school preparation or an equivalent for all matriculants.

- I. Applicants may be admitted without examination if they bring certificates of graduation from, or standing in, institutions of the collegiate grade or present other credentials showing that they have successfully completed the branches of study embraced in a full four-year high school course, or an equivalent, provided that among the branches completed are:

English, two years, including the principles of composition and practice in written expression.

Algebra, one year, elementary, up to beginning of higher algebra.

Geometry, one year, elementary.

Physics, one year, elementary.

Latin, two years: grammar, one year; Caesar (four books), one year.

- II. Other applicants must pass examinations in the branches above specified, i. e., in English, algebra, geometry, physics and Latin, or present satisfactory evidence of having completed these branches, for which substitutes cannot be accepted.

Students will be allowed to carry not more than two conditions which, however, must be removed before the final examinations in the first year subjects.

In certain cases credit is given for drug store experience.

## B—TO THE THREE-YEAR COURSE

The minimum requirements for admission to the three-year course are the same as those for admission to the two-year course II, with the exception that students may carry as conditions not more than three of the entrance subjects among which English cannot be. Students must pursue the branches in which they are conditioned during their first year and pass examinations in them or present evidence of having satisfactorily completed the branches. The subjects are not taught at the college but

may be taken at the academy near by, or at the city high schools or with private tutors. The University Y. M. C. A. usually establishes courses for the benefit of students conditioned in entrance branches.

Applicants whose preparatory course of study has not conformed precisely to the requirements above enumerated will be allowed to offer, in lieu of a portion of these requirements, equivalent preparation in similar branches of study; and if they show by examination, or by other evidence, that their preparation has been substantially equivalent, such branches will be accepted as substitutes for those omitted.

The examinations for entrance are conducted by the faculty of the College of Pharmacy, beginning at 9:00 a.m., on Tuesday, September 12, 1911. Lecture work begins as soon as possible after the examinations, usually the following day.

Every applicant is required to furnish a certificate of good moral character.

Those who do not pass the entrance examinations, may enter and complete their course in three years, provided they pursue the subjects required for admission, in addition to the professional work that may be assigned to them, and pass their entrance examinations, before the end of the first year.

### REGISTRATION

All applicants for admission to the regular courses must present to the Dean not later than September 12, their school or high school certificates, diplomas or such other credentials as they may wish to offer toward meeting in whole or in part the entrance requirements. If these are found satisfactory the applicant will register in the office of the University Registrar, who will issue a card to the University Accountant to whom the applicant will pay the tuition and breakage fee and microscope rental and receive receipts therefor. Registration is completed by depositing these receipts in the office of the Dean. The student is then classified.

### ADVANCED STANDING

Applicants for advanced standing must pass the entrance examinations or present the usual equivalents. They must furnish satisfactory evidence of time spent and subjects covered in previous professional studies, and must pass the examinations of all departments in which they wish to be exempt, if such examinations are deemed necessary by the professors in charge. Students will not be permitted to substitute private work in any branch for the regular course work.

### UNCLASSED STUDENTS

Unclassed or special students may enter at any time providing there is laboratory room for them. They will not be rated on their work nor

examined unless they make special request therefor. Work completed will be credited should the student subsequently enter the regular course.

## EXAMINATIONS AND STANDINGS

Examinations are held at the end of the regular school year and during the last week of the first semester, and are supplementary to the written tests and quizzes that are held at frequent intervals during the year, and with them form largely the basis of final determination of fitness for promotion or graduation. Students are rated throughout the year, and all who have a standing of ninety per cent, or more, in certain of the branches, may not be required to take the final examination in those branches.

Students are not required to write graduating theses, but instead, they keep complete records of their laboratory work. The records are to be kept in substantially bound books, to be approved by the faculty. The respective professors call for the records for inspection and rating once a month or oftener. Duplicates of records are to be furnished the college by the students. The college provides the paper.

The standing of students is determined by the results of recitations, written examinations, laboratory work and attendance. It is indicated by the terms "excellent," "passed," "conditioned," "incomplete" or "failed." Conditions may be removed as indicated below. Incomplete work must be made up before the final examinations of the following year.

In order to become eligible for final examinations, students are required to attend at least four-fifths of the lectures in each course. This rule is not intended for the benefit of those who seek admission after the opening of the college year, but is designed to cover cases of sickness or unavoidable absence. It does not apply to laboratory courses which must be taken in full and must be entered during the first week in which they begin.

Students having conditions in more than two major or in more than three minor subjects of the first year cannot enter upon the second year's work. All entrance conditions must be removed before the next spring examination. Candidates for graduation must have removed all conditions before entering upon the second semester of the graduating year.

Condition examinations are held during the first week of the course in September. The dates are usually posted in June. Conditioned students are required to inform themselves as to these dates as soon as they learn that they are conditioned, as no other notice is given.

A fee of one dollar is charged for a second condition examination.

Failure at the second condition obliges the student to repeat the work of the respective course.

Students who carry a condition into a succeeding year may find a conflict of lecture or laboratory hours. In such cases they are to give preference to the lower course.

Absence will not be excused, unless satisfactory reasons are given to the professor in charge. Habitual absence without a satisfactory excuse, continued indifference to study, or persistently poor scholarship may subject the student to temporary or permanent suspension. Students are earnestly requested to be present at the beginning of the school year, but those who cannot enter in the fall may enter at the beginning of the second semester taking any of the subjects beginning then. Any of the facilities for work in the University are open to the students of this college, subject to the approval of the Dean. Opportunity is afforded to do advanced work in all branches. Text-books may be obtained after coming to the University.

The work of the college, as outlined in the following pages, is conducted by means of lectures, recitations and laboratory exercises. Students find their time fully occupied. Those who feel unable to complete the work in two years may divide it in a manner to complete it in three years. Practising pharmacists who desire to take certain branches of study may avail themselves of any of the college facilities.

## GRADUATION REQUIREMENTS

Regular attendance at lectures, recitations and laboratory exercises is required. Students will not be permitted to present themselves for final examination unless they have been in attendance upon at least seven-eighths of the required number of exercises.

Every person upon whom the degree is conferred must be of good moral character and must be at least twenty-one years old; must have attended two full lecture and laboratory courses, the last at this college, and must have passed a successful examination in the subjects required for graduation.

Drug store experience is not a requirement for graduation.

Those who fail to appear for examination after having paid their diploma fee, or those who do not pass satisfactorily, will be permitted to present themselves at any subsequent examination, upon payment of an additional fee of five dollars, and complying with all other requirements.

## DEGREES

The college confers the degrees Bachelor of Pharmacy, Master of Pharmacy and Doctor of Pharmacy for the completion of respectively the regular and the two graduate courses.



## FEES

## TWO YEAR REGULAR COURSE

|                          |                |
|--------------------------|----------------|
| First year tuition.....  | \$75.00        |
| Second year tuition..... | 90.00          |
|                          | <hr/> \$165.00 |

## THREE YEAR REGULAR COURSE

|                                                     |                |
|-----------------------------------------------------|----------------|
| First year tuition.....                             | \$45.00        |
| Second year tuition.....                            | 55.00          |
| Third year tuition.....                             | 65.00          |
|                                                     | <hr/> \$165.00 |
| Annual deposit covering all laboratories.....       | \$10.00        |
| Annual microscope rental.....                       | 2.00           |
| Second condition examination fee, each subject..... | 1.00           |

## FIRST GRADUATE COURSE

|                                    |                |
|------------------------------------|----------------|
| Tuition for the entire course..... | \$75.00        |
| Final examination fee.....         | 10.00          |
|                                    | <hr/> \$ 85.00 |

There are no other tuition fees. Fees are payable at the time of registration. Those desiring to take special work will be required to pay an average of fifteen dollars a subject for the lecture courses and twenty-five dollars for the laboratory courses.

Students will be charged for laboratory material if used unreasonably. At the end of the laboratory courses students will be required to pay for breakage and damage to utensils in their care. If a student is careful this charge need not amount to more than two or three dollars. Students are to provide themselves with a designated set of metric weights, a set of apothecary's weights and steel spatulas. The expense of these may be kept within three dollars. Students using platinum crucibles are charged for them. Upon the return of the crucible in the original condition the charge is cancelled; if the crucible is in any wise damaged the full value is collected from the student. A rental of two dollars per college year or fraction thereof is collected for use of a microscope. All money is payable to the University Accountant, who will give receipt which must be deposited in the Dean's office.

Fees will not be returned, except in case of discontinuance for sufficient reason before the student has been assigned to a place in the laboratory.

A deposit of ten dollars will be made with the Accountant each year, by every student, at the time of enrollment as a caution fee. The fee is intended to cover the cost of unnecessary damage to or in the college buildings and of breakage and loss of laboratory apparatus and

material. It will be returned to the student at the close of each year, minus the cost of articles assigned to him that he fails to return in good condition, or of damage to college property for which he is individually responsible. If responsibility for such damage cannot be individually fixed, a pro rata charge upon all students will be made.

In each laboratory course the student will be assigned a certain amount of apparatus and material, for which he will give receipt. At the end of each course, if such apparatus and material are restored in good condition, this receipt will be returned to him.

All apparatus lost or damaged will be charged to him, and must be paid for before he can receive credits for his course, or take his annual examinations.

### COLLEGE TRAINING FOR PHARMACISTS

The recognition of the need of substantial college training for pharmacists finds expression in many ways. In New York, Pennsylvania, Hawaii, Wisconsin, Ohio and Louisiana, such training is obligatory either by law or by rule of the boards of pharmacy. In a number of other states credit is given for college work. In Minnesota graduates from recognized colleges need to have had only two years of practical experience, while all others must have had four years of drug store experience before they become eligible for examination by the State Board of Pharmacy for full license to practice in Minnesota. Graduates of the three-year course who have gained practical experience concurrently with their college work need only one additional year of drug store experience before they become eligible for examination for full registration.

At the Joint Conference of the National Association of Boards of Pharmacy and the American Conference of Pharmaceutical Faculties, held at Indianapolis, Ind., in September, 1906, the following resolution was adopted:

"Special education for the practice of pharmacy is in this age a necessity and should as rapidly as possible be made compulsory. The rules of the boards of pharmacy are such as to promote and encourage it in all practicable ways. The special pharmaceutical education should include substantial laboratory courses." The training advocated by these two most representative bodies and by the American Pharmaceutical Association can be obtained only at colleges or schools of pharmacy of recognized standing. It is admitted that the State of Minnesota through its University College of Pharmacy is affording instruction of the most approved kind.

In the organization of this college the Board of Regents and the

faculty have had the co-operation of the pharmacists of the state. The character of instruction is of high order and every effort is made to comply with the demands of the profession of the Northwest, or elsewhere, in the maintenance of a course of instruction of the highest grade.

### POSITIONS FOR GRADUATES

The demand for graduates of this college has always been greater than the supply and is continually growing. The rule is that practically all of the senior class are engaged before graduation. This college is recognized in all states, including those in which standards of efficiency have been established, and its graduates are everywhere admitted to board examinations.

### STATE BOARD OF PHARMACY

The State Board of Pharmacy meets at the college four times each year to examine candidates for registration. For information concerning the Board or State examinations address the Secretary of the Board, 31 West Tenth Street, corner St. Peter Street, St. Paul, Minnesota.

### COLLEGE OF PHARMACY ALUMNI ASSOCIATION

The Alumni Association of the College of Pharmacy meets annually in the college building the day before Commencement, at 3 p. m. Every member of the association is urgently requested to report change of address to the secretary.

### THE AMERICAN CONFERENCE OF PHARMACEUTICAL FACULTIES

The College of Pharmacy of the University of Minnesota is one of the colleges constituting the American Conference of Pharmaceutical Faculties.

### COMMUNICATIONS

Address communications to the Dean, Professor Frederick J. Wulling, University of Minnesota, Minneapolis, Minn.

### PHI DELTA CHI

The Theta chapter of the Phi Delta Chi fraternity was organized at the College of Pharmacy in 1904. Students of the college of high scholarship are eligible to membership.

THE NORTHWESTERN BRANCH OF THE AMERICAN  
PHARMACEUTICAL ASSOCIATION

The Northwestern Branch of the American Pharmaceutical Association, composed of the representative pharmacists of the Northwest, has its headquarters at the College of Pharmacy. About six meetings are held annually. Students of pharmacy are eligible to membership in the Branch, but are privileged to attend the meetings without becoming members.

## Courses of Study

---

Three courses are offered, the regular and two graduate courses.

The complete regular course extends over two years of nine full months each. Students may arrange their work so as to take the course in three years. The twentieth annual course begins on September 12, 1911, on which day all students in pharmacy should register. The office of the Registrar is open for the purpose of registration as early as September 11th, but students must first report at the Dean's office in the pharmacy building.

In addition to the regular course this college offers two graduate courses, the first continuing through one college year and leading to the degree "Master of Pharmacy," and the second continuing through an additional year or longer, and leading to the degree "Doctor of Pharmacy." The first graduate course, the one leading to the master's degree, is now in operation. The curriculum includes higher pharmaceutical chemistry, pharmaceutical assaying, higher organic chemistry, proximate and ultimate analysis, chemistry of food, water analysis, toxicology, spectroscopic work, therapeutics, clinical microscopy and bacteriology, and a thesis of at least 3,000 words, embodying the results of original work, but this curriculum may be changed by the faculty if occasion or experience require.

The requirements for admission to the first graduate course are a diploma from a Minnesota high school of the first grade, or an equivalent; a diploma from a college of pharmacy whose curriculum, extent and kind of work and length of under-graduate course are equal to those of the under-graduate work of this college; an acquaintance with either German or French sufficient to enable the student to read and understand the scientific literature of those languages. The fees for this course are seventy-five dollars, and an additional fee of ten dollars for the final examinations. The rules relating to damage, waste and breakage in laboratories are the same as those applying to the under-graduate course.

The course leading to the doctor's degree will begin as soon as there are sufficient applicants.

### PROPOSED NEW COURSES

Beginning as soon as the proposed enlarged quarters of the college permit, two additional courses may be instituted: the one a lower and shorter than the regular course to conform to the minimum requirements



of the American Conference of Pharmaceutical Faculties; the other, a higher than the regular course to lead to the degree "Bachelor of Science in Pharmacy," and to include four years of work. The details have not yet been worked out, but it is probable that the former will include about two-thirds of the work of the regular course and will cover two years of at least six months each. The entrance requirements will include the first year in high school or equivalent training or whatever the entrance requirements of the Conference may be at the time.

The higher course will cover four years of nine months each and will include two years of academic and cultural work. The qualifications for entrance to this course will be the same as those required for entrance to the College of Science, Literature, and the Arts. Those presenting evidence of having completed the first two years of a collegiate course may complete the course in two years, providing the collegiate work completed includes certain subjects in the sciences and mathematics. Full announcement regarding these courses will be made duly.

## COURSES OF INSTRUCTION COMPRISING THE REGULAR PHARMACY COURSE

The complete regular course extends over two years of nine full months each. Students may arrange their work so as to take the course in three years. The twentieth annual course begins on September 12, 1911, on which day all students in pharmacy should register. The office of the Registrar is open for the purpose of registration as early as September 11th, but the students must first report at the Dean's office in the pharmacy building.

### FIRST YEAR

#### FIRST QUARTER

Botany 1, six hours, Professor Clements, Assistant Professor Butters and Miss Misz

Pharmacy 9, five hours, Professor Wulling

Pharmacy 1, 2, and 3, six hours, Professor Wulling, Dr. Bachman and Assistant

Chemistry 1, fifteen hours, Professor Derby and Mr. Handy

#### SECOND QUARTER

Botany 1, six hours, Professor Clements, Assistant Professor Butters and Miss Misz

Pharmacy 10, three hours, Professor Wulling

Pharmacy 1, 2, and 3, six hours, Professor Wulling, Dr. Bachman, Dr. Blossmo and Assistant

Chemistry 2, fifteen hours, Professor Derby and Mr. Handy

## THIRD QUARTER

Botany 2, six hours, Professor Clements, Assistant Professor Butters and Miss Misz

Pharmacy 11, two hours, Professor Wulling

Pharmacy 4, six hours, Professor Wulling, Dr. Bachman, Dr. Blosmo and Assistant

Pharmacognosy 1 and 2, three hours, Dr. Newcomb and Assistant

Pharmacy 7, one hour, Dr. Bachman

Materia Medica 1, three hours, Professor Brown and Assistant

Chemistry 5, fifteen hours, Professor Frankforter, Assistant Professor Derby and Mr. Handy

Pharmacognosy 1 and 2, three hours, Dr. Newcomb and Assistant

## FOURTH QUARTER

Botany 2, six hours, Professor Clements, Assistant Professor Butters and Miss Misz

Pharmacy 11, two hours, Professor Wulling

Materia Medica 1, three hours, Professor Brown and Assistant

Pharmacy 4, 5, and 6, six hours, Professor Wulling, Dr. Bachman, Dr. Blosmo and Assistant

Pharmacy 7, two hours, Dr. Bachman

Pharmacy 8, one hour, Dr. Bachman

Chemistry 5, fifteen hours, Professor Frankforter, Assistant Professor Derby and Mr. Handy

## SECOND YEAR

## FIRST QUARTER

Pharmacy 12 and 13, two hours, Professor Wulling

Pharmacy 14, sixteen hours, Professor Wulling, Dr. Bachman, Dr. Blosmo and Assistant

Pharmacognosy 3, 4, and 5, nine hours, Dr. Newcomb and Assistant

Pharmacy 16 and 17, twelve hours, Professor Wulling, Dr. Bachman and Assistants

Pharmacy 23, one hour, Dr. Bachman

Materia Medica 2, three hours, Professor Brown and Assistant

## SECOND QUARTER

Pharmacy 13, two hours, Professor Wulling

Mineralogy and Crystallography, four hours, Mr. Grout

Pharmacognosy 3, 4, and 5, nine hours, Dr. Newcomb and Assistant

Pharmacy 18, twenty hours, Professor Wulling, Dr. Bachman, Dr. Blosmo and Assistant

Pharmacy 23, one hour, Dr. Bachman

Physiology 1, two hours, Professors Beard and Wilcox and Dr. Scott

## THIRD QUARTER

Pharmacognosy 3, 4, and 5, six hours, Dr. Newcomb and Assistant  
Chemistry 3, nine hours, Professor Sidener and Assistant  
Pharmacy 23, one hour, Dr. Bachman  
Pharmacy 13, two hours, Professor Wulling  
Pharmacy 19, fifteen hours, Professor Wulling, Dr. Bachman, Dr. Blossmo and Assistant

## FOURTH QUARTER

Pharmacy 15, five hours, Professor Wulling and Dr. Bachman  
Pharmacy 13, one hour, Professor Wulling  
Pharmacy 23, one hour, Dr. Bachman  
Pharmacognosy 3, 4, and 5, eight hours, Dr. Newcomb  
Pharmacy 20, 21, 22, 24, twelve hours, Professor Wulling, Dr. Bachman, Dr. Blossmo and Assistant  
Therapeutics 3, one hour, Professor Brown and Assistant  
Pharmacy Law, one and one-half hours, Professor Wulling  
First Aids, one and one-half hours, Dr. McCloud

## THIRD YEAR

Students taking three years to do the work of the regular two-year course will divide the work in an equitable way subject to the approval of the Dean. Students are urged to devote three years to the completion of the course.

# Departmental Statements

---

## BACTERIOLOGY

### 1. GENERAL BACTERIOLOGY (POST GRADUATE)

PROFESSOR WESBROOK,  
DR. FIDLAR AND DR. SUNDT

Twelve lecture and recitation hours, and twelve laboratory hours per week.  
Second year, fourth quarter

Lectures and demonstrations. The general scope of bacteriology, the history of its development and the biological and chemical problems involved in the life history of bacteria will be dealt with. The classification of the various bacterial forms, the methods of isolation and culture and the composition and manufacture of culture media will be studied until a thorough knowledge of technique is acquired. General and special study of the various antiseptics, disinfectants and bactericidal substances and conditions will be undertaken.

Laboratory work, involving the making of their own culture media by the students, the study of bacteria in cultures and under the microscope, technique of staining and other methods, including observations of chemical and biological peculiarities, will be thoroughly carried out. Testing of various germicides—chemical and physical—and the use of bacteriological methods in the examination of drinking water will form an important part of the work.

## BOTANY AND MICROSCOPY

FREDERIC E. CLEMENTS, Ph. D., Professor of Botany

FREDERIC K. BUTTERS, M. S., Assistant Professor of Botany

ALICE MISZ, M. A., Instructor in Botany

.....Assistant

1, 2, and 3: ten credits (one hundred and eight hours lecture, one hundred forty-four hours laboratory)

First year

### 1. COMPARATIVE MORPHOLOGY OF THE CRYPTOGAMS

PROFESSOR CLEMENTS,

ASSISTANT PROFESSOR BUTTERS AND MISS MISZ

The course embraces morphology of the cryptogams. Especial attention is paid to the green algae, the foundation of the vegetable kingdom. The other groups of algae and the fungi are briefly treated, particular stress being laid on their economic relations to other plants, to animals and to man. Examples of liverworts, mosses, ferns, and their allies are studied in the laboratory, and the line of development which leads from the algae through the archegoniate series to the seed plants is emphasized.

2. THE MORPHOLOGY, ANATOMY AND CLASSIFICATION OF THE HIGHER SEED PLANTS  
 PROFESSOR CLEMENTS, ASSISTANT PROFESSOR BUTTERS AND MISS MISZ  
 Prerequisite, botany 1

In this course especial attention is paid to vegetable histology. The characteristic plant tissues are examined, and their arrangement is noted in roots, stems, leaves, fruit and seeds. The formation and occurrence of carbo-hydrates, glucosides, alkaloids, organic acids, resins, gums, gum resins and oleo-resins are carefully studied. Considerable time is devoted to a study of the basis of classification of flowering plants and to the identification of plants in the field.

3. MICRO-BOTANY ASSISTANT PROFESSOR BUTTERS AND MISS MISZ

Designed to furnish practical training in the use of the microscope, in the preparation of material for microscopic examination, including the use of micro-chemical reagents, and in the representation by drawings of all structures observed.

The work of this course is co-incident with that of 2 and 3.

## CHEMISTRY

GEORGE B. FRANKFORTER, M. A., Ph. D., Professor of Chemistry  
 CHAS. F. SIDENER, B. S., Professor of Quantitative Chemistry  
 EVERHART P. HARDING, M. S., Ph. D., Assistant Professor of Chemistry  
 IRA HARRIS DERBY, Ph. D., Assistant Professor of Chemistry  
 JOHN A. HANDY, Ph. C., Instructor in Chemistry

1. GENERAL CHEMISTRY PROFESSOR DERBY AND MR. HANDY  
 Five credits (forty-five hours lecture, ninety hours laboratory)

First quarter, first year

This course includes a study of the chemical properties of the metallic and non-metallic elements.

2. QUALITATIVE ANALYSIS ASSISTANT PROFESSOR DERBY AND MR. HANDY  
 Five credits (forty-five hours lecture, ninety hours laboratory)

Second quarter, first year

Prerequisite, chemistry 1

This course covers the common reactions of the metals and acids and their qualitative separation. The ionic theory and the law of mass action are discussed with especial reference to qualitative reactions.

3. QUANTITATIVE ANALYSIS PROFESSOR SIDENER AND ASSISTANT  
 Three credits (twenty-seven hours lecture, fifty hours laboratory)

Third quarter, second year

Prerequisites, chemistry 1 and 2

A study of the principles of quantitative estimation; gravimetric, volumetric and gasometric.

4. TOXICOLOGY, WATER AND FOOD ANALYSIS (POST GRADUATE)

PROFESSORS FRANKFORTER, DERBY AND HARDING

Three and one-half credits (twenty-seven hours lecture, seventy-two hours laboratory)

Second quarter, second year

The chemistry of the atmosphere, water, soil, etc.; the sanitary examination of air and water.



## 5. ORGANIC CHEMISTRY PROFESSORS FRANKFORTER, DERBY AND MR. HANDY

Nine and one-half credits (seventy-two hours lecture, one hundred ninety-eight hours laboratory) Third and fourth quarters, first year

This course includes work in both the aliphatic and aromatic series and the preparation of the more important compounds.

## CLINICAL MICROSCOPY

## 1. CLINICAL MICROSCOPY (POST GRADUATE) DR. H. E. ROBERTSON AND DR. HYNES

Instruction includes (a) the microscopical study of urine, its colors, sediments, and finer chemical tests; (b) the microscopical study of urinary sediments, including blood, pus, epithelial cells, casts, etc.

## DISPENSARY PRESCRIPTION PRACTICE

The dispensing department of the University College of Medicine and Surgery Free Dispensary at 1808 Washington Avenue South, Minneapolis, has lately been placed in charge of the College of Pharmacy, Dr. G. Bachman having supervision. The senior students are sectioned into classes of three for the purpose of doing practical prescription work at the dispensary under the direction of Dr. Bachman or Dr. Bloomo. The dispensary practice continues throughout the college year.

## FIRST AIDS TO THE INJURED

## 1. EMERGENCY CASES

DR. McCLOUD

Two-thirds credit (twelve hours lecture)

Third quarter, second year

A series of lectures designed to qualify the pharmacist to administer upon emergency cases before the arrival of the physician.

## MATERIA MEDICA AND THERAPEUTICS

E. D. BROWN, Pharm. D., M. D., Acting Professor of Materia Medica and Therapeutics

C. F. DIGHT, M. D., Instructor in Materia Medica

.....Assistant in Materia Medica

## 1. INORGANIC MATERIA MEDICA

PROFESSOR BROWN AND ASSISTANT

## 2. ORGANIC MATERIA MEDICA

PROFESSOR BROWN AND ASSISTANT

Six credits (one hundred and eight hours lecture and recitation)

Third and fourth quarters, first year, first and second quarters, second year

The work in inorganic and organic materia medica is based principally on the U. S. P., but unofficial and synthetic drugs are also studied. The course includes the study of the general characteristics of drugs and physiological action. Pharmacodynamics, including the study of the identity and quality of drugs, shares attention in the course in pharmacognosy.

## THERAPEUTICS

PROFESSOR BROWN AND DR. DIGHT

One credit (eighteen hours lecture and recitation)

Third quarter, second year

Prerequisites, materia medica 1 and 2

In this course drugs are studied in groups, as governed by their physiologic action, and the therapeutic features of such groups are described. Remedial measures other than those depending upon drugs are fully considered.

## PHARMACY

FREDERICK J. WULLING, Phm. D., LL. M., etc., Professor of Pharmacology

GUSTAV BACHMAN, Phm. D., Phm. M., Instructor in Pharmacy

OSCAR BLOSMO, Ph. C., Assistant in Pharmacy

## 1. HISTORY OF PHARMACY

PROFESSOR WULLING

One-third credit (six hours lecture)

First quarter, first year

The history of the U. S. Pharmacopœia through all its revisions.

Dispensatories, text-books, and works of reference.

## 2. METROLOGY

PROFESSOR WULLING, DR. BACHMAN AND DR. BLOSMO

Two-thirds credit (twelve hours lecture)

First quarter, first year

Weights and measures, including metric system; balances—construction, varieties, methods of weighing; specific gravity in detail; specific volume, alligation, etc.

## 3. THE PHYSICS OF PHARMACY

PROFESSOR WULLING, DR. BACHMAN

AND DR. BLOSMO

Three credits (eighteen hours lecture, seventy-two hours laboratory)

Second quarter, first year

Prerequisite, pharmacy 2

Students are required to have had elementary physics before entering. This course covers a review and more extended elucidation of such divisions of physics as apply to pharmaceutical processes. Special attention is paid to heat. Specific heat; thermometers—the various scales, testing and comparing thermometers; combustion of solids, liquids and gases in various kinds of furnaces, stoves and burners; application of heat in drying ovens, steam, hot-air and water ovens; drying closets, desiccators, blow-pipes, crucibles; baths for controlling and equalizing heat; evaporation—spontaneous, rapid, slow, in vacuo; ebullition—boiling points, fusion; sublimation, calcination, dehydration, torrefaction, roasting, reduction, oxidation, carbonization, deflagration, ignition, etc.; solution—pharmaceutical, simple, chemical, saturated; circulatory displacement; dialysis—construction of dialyser, osmosis, endosmosis, exosmosis; crystalloids and colloids, etc.

## 4. PHARMACEUTICAL PROCESSES

PROFESSOR WULLING, DR. BACHMAN AND

ASSISTANT

Three and one-half credits (twenty-four hours lecture, seventy-two hours laboratory)

Second and third quarters, first year

Prerequisite, pharmacy 3

The processes not taken up in 3, constitute the subjects of this course. In part they are; drug grinding and powdering; comminution; contusion; trituration; sifting; elutriation; levigation; lixiviation; filtration—filtering media, filtration of solutions, oils, syrups, rapid filtration, filtration in vacuo, hot filtration, colation; washing—displacement, continuous; decantation—the syphon and its uses; pre-

cipitation—methods, vessels, separating, drying, weighing; granulation—granular effervescent salts; desiccation; exsiccation; crystallization—water of crystallization, deliquescence, methods of obtaining crystals, collecting, draining, washing, drying crystals, fractional crystallization; distillation—simple, fractional, destructive; extraction; maceration; expression; percolation—history, theories, percolators, exhaustion, repercolation, continuous percolation, fractional percolation; clarification; decolorization.

5. PHARMACOPOEIAL PREPARATIONS PROFESSOR WULLING, DR. BACHMAN  
AND ASSISTANT

Five credits (thirty hours lecture, one hundred twenty hours laboratory)

Third and fourth quarters, first year

This course includes the study and preparation of official bodies for which the U. S. P. gives formulæ and processes, and includes waters, solutions, syrups, mucilages, spirits, infusions, decoctions, tinctures, fluid extracts, vinegars, wines, liniments, oleates, ointments, cerates, resins, oleo-resins, honeys; glycerites, mixtures, emulsions, elixirs, collodions, pills, capsules, powders, suppositories, bougies, plasters, papers, cachets, etc.

6. MATHEMATICS OF PHARMACY PROFESSOR WULLING AND DR. BACHMAN

While students are required to have a preparation in arithmetic and algebra before entering, they receive frequent drills at stated hours and as occasion requires or suggests throughout the entire course. Students are required to take a final examination in the subject at the end of the first year, at which examination they must attain a rating of at least eighty per cent.

7. PHARMACY QUIZ DR. BACHMAN

Three credits (fifty-four hours) Second, third and fourth quarters  
first year

Prerequisites, pharmacy 2, 3, 4, and 5.

A thorough review of the work covered in 2, 3, 4, and 5.

8. IDENTIFICATION OF INORGANIC OFFICIAL PREPARATIONS DR. BACHMAN

One credit (eighteen hours) Second and third quarters, first year  
The study of the physical properties of official preparations.

9. CHEMICAL PHILOSOPHY PROFESSOR WULLING

One and one-half credits (twenty-seven hours lecture) First quarter, first year

Treats of the principles underlying chemistry, and endeavors to elucidate chemical facts and phenomena. The subject is divided into chemical statics, embracing the study of the theories of atoms and molecules, atomic weights, atomic and molecular volume, quantivalence, molecular structure, ions, electric qualities, etc., and chemical dynamics, the study of reactions and their equations, thermics, chemical properties in general, etc.

10. THE PHARMACEUTICAL CHEMISTRY OF THE NON-METALS AND THEIR PREPARATIONS PROFESSOR WULLING

One and one-half credits (twenty-seven hours lecture) Second quarter, first year

Prerequisite, pharmacy 9

11. PHARMACOPOEIAL INORGANIC SALTS AND THEIR OFFICIAL PREPARATIONS PROFESSOR WULLING

Three credits (fifty-four hours lecture) Third and fourth quarters, first year  
Prerequisites, pharmacy 10

Especial reference to description, properties and manufacture.

12. CLASSIFICATION OF PHARMACEUTICAL ORGANIC COMPOUNDS  
 PROFESSOR WULLING  
 One credit (eighteen hours lecture) Third quarter, first year  
 A preparation for pharmacy 13
13. CHEMISTRY OF THE PHARMACOPOEIAL ORGANIC COMPOUNDS AND THEIR PREPARATIONS  
 PROFESSOR WULLING  
 Three credits (fifty-four hours lecture) First, second and third quarters, second year  
 Prerequisite, pharmacy 12  
 This course includes the critical study of cellulin and its derivatives, destructive distillation products, starches, sugars, fermentation products, organic acids, fixed oils and fats, volatile oils, waxes, and animal fats, alkaloids, glucosides, animal drugs and products, etc.
14. PHARMACOPOEIAL TESTING PROFESSOR WULLING, DR. BACHMAN AND ASSISTANTS  
 Five credits (thirty-six hours lecture, one hundred eight hours laboratory) First quarter, second year  
 A critical study of the identity, purity, limit and percentage tests of the Pharmacopoeia and their application either wholly or in part to practically every official organic and inorganic salt and compound.
15. QUANTITATIVE ANALYSIS OF U. S. P. SALTS AND PREPARATIONS  
 PROFESSOR WULLING AND DR. BACHMAN  
 Two credits (eighteen hours lecture, thirty-six hours laboratory) Fourth quarter, second year  
 Prerequisites, chemistry 3 and pharmacy 14  
 This course includes the gravimetric, volumetric and gasometric determinations of the U. S. Pharmacopoeia, but not pharmaceutical assay work (20).
16. INCOMPATIBILITY PROFESSOR WULLING AND DR. BACHMAN  
 One-half credit (nine hours lecture) Second and third quarter, second year  
 Therapeutic, pharmaceutical and chemical incompatibility is taken up in lecture and recitation work preliminary to 17.
17. DISPENSING PROFESSOR WULLING AND DR. BACHMAN  
 Five and one-half credits (twenty-seven hours lecture, one hundred forty-four hours laboratory) Third and fourth quarters, second year  
 Prerequisite, pharmacy 16  
 The study of the prescription and practical work in dispensing upwards of one hundred typical prescriptions.
18. MANUFACTURE OF OFFICIAL ORGANIC AND INORGANIC SALTS AND PREPARATIONS  
 PROFESSOR WULLING, DR. BACHMAN AND ASSISTANT  
 Four and one-third credits (twenty-four hours lecture, one hundred eight hours laboratory) Second quarter, second year  
 The preparation of about forty official salts included in the course.
19. NATIONAL FORMULARY PROFESSOR WULLING AND DR. BACHMAN  
 One credit (six hours lecture, twenty-four hours laboratory) Third quarter, second year  
 This course includes the study of the National Formulary and the making of one or more members of each class of preparations.

20. PHARMACEUTICAL ASSAY                      PROFESSOR WULLING, DR. BACHMAN AND ASSISTANT  
 One and one-third credits (six hours lecture, thirty-six hours laboratory)                      Fourth quarter, second year  
 Prerequisites, pharmacy 14 and chemistry 3  
 The quantitative determination of active constituents of a number of the potent organic drugs and preparations.
21. SYNTHETIC REMEDIES                                              PROFESSOR WULLING  
 One-third credit (six hours lecture)                      Fourth quarter, second year  
 Prerequisite, pharmacy 12 and 13 and chemistry 4  
 A study of the chemistry of synthetic remedies in medical use.
22. HOMEOPATHIC PHARMACY                      PROFESSOR WULLING AND DR. BACHMAN  
                                                                                             Fourth quarter, second year.  
 A brief exposition of the principles underlying homeopathic medication, with some laboratory work.
23. IDENTIFICATION OF SALTS                                              DR. BACHMAN  
 One and one-half credits (fifty-four hours laboratory)                      Second semester, first year and entire second year  
 The study of the physical identity of the more important official inorganic and organic salts.
24. MICRO-CHEMISTRY                                              PROFESSOR WULLING  
                                                                                             Fourth quarter, second year. (Optional)  
 A brief course is provided for seniors if time permits.

### PHARMACEUTICAL JURISPRUDENCE

1. LAW FOR PHARMACISTS                                              PROFESSOR WULLING  
 Two-thirds credit (twelve hours lecture)                      Fourth quarter, second year  
 The lectures introduce the subjects of contracts, agency, commercial paper insurance, and discuss the liability of retail and manufacturing pharmacists, etc

### PHARMACEUTICAL MINERALOGY AND CRYSTALLOGRAPHY

1. MINERALOGY                                              MR. GROUT  
 One credit (eighteen hours lecture)                      Second quarter, second year  
 A study of the occurrence and properties of minerals of pharmaceutical importance; ores of metals used in pharmacy; non-metallic minerals and mineral waters in their mineralogic and geologic relations.
2. CRYSTALLOGRAPHY                                              MR. GROUT  
 One credit (eighteen hours lecture)                      Second quarter, second year  
 Prerequisite, mineralogy 1  
 A survey of form and more evident physical characters as a basis for practice in sight recognition of economic minerals and their distinction from common rocks.

### PHARMACOGNOSY

The courses in pharmacognosy are designed to give the student that specific training which will enable him to determine the identity and quality of both crude and powdered vegetable drugs. Some attention is given in these courses to the methods and results of pharmaco-physiological research.



.....Professor of Pharmacognosy  
 EDWIN L. NEWCOMB, P. D., Instructor in Pharmacognosy  
 (At present in charge of the work).  
 .....Assistant

## COURSES 1 AND 2

DR. NEWCOMB AND ASSISTANT

Together, two credits (eighteen hours lecture, thirty-six hours laboratory)  
 Second semester, first year

## 1. PHARMACOGNOSY OF THE CRYPTOGAMS

In this course many of the valuable drugs and economic products obtained from the cryptogams are studied.

## 2. PHARMACO-HISTOLOGY

This course is designed to complete the preparation of the student for the senior work in pharmacognosy. It includes micrometry and the detailed study of the inner structure of the parts of the higher plants as illustrated in about forty official and unofficial drugs.

## COURSES 3, 4, AND 5

DR. NEWCOMB AND ASSISTANT

Together, ten credits (one hundred eight hours lecture, two hundred sixteen hours laboratory including field work)  
 First and second semester,  
 second year

Prerequisites, pharmacognosy 1; botany 1, 2, and 3.

## 3 AND 4. PHARMACOGNOSY OF THE ANGIOSPERMS

In this course the time is devoted to the scientific study both macroscopically and microscopically, of the official and of some of the unofficial vegetable drugs. The work naturally divides itself into the study of crude drugs (course 3) and of powdered drugs (course 4).

For convenience and purposes of comparison drugs will be studied under 3 in the following order: seeds, roots, and rhizomes; barks, woods and pith; flowers; fruits; leaves and herbs; exudations and other plant products. Here or at some other consistent place animal drugs and plant and animal fibers will be studied.

In course 4 the more important vegetable drugs occurring in powdered form are examined and studied microscopically. The adulterants of powdered drugs and their detection are given considerable attention.

## 5. FIELD WORK

In the spring of the year and at other suitable times the classes are taken on field excursions to search for native medicinal plants. The study of the distinguishing characteristics of certain orders, families and genera, to which the medicinal plants belong, is included in this work.

## PHYSIOLOGY

RICHARD OLDING BEARD, M. D., Professor of Physiology

M. R. WILCOX, M. D., Professor of Physiology

JULIUS PARKER SEDGWICK, B. S., M. D., Assistant Professor of Physiological Chemistry

FREDERICK H. SCOTT, B. A., Ph. D., M. D., D. Sc., Assistant Professor of Physiology

F. W. SCHLUTZ, A. B., M. D., Instructor in Physiological Chemistry

## 1. PHYSIOLOGY, ANATOMY AND HISTOLOGY PROFESSORS BEARD, WILCOX AND SCOTT

One credit (eighteen hours lecture and recitation) First quarter, second year

1. The work covers the study of the physiological properties of the cell, the nutritive media, the nervous mechanisms in general, muscular tissues, connective tissues and epithelial tissues. The subjects of anatomy and histology are touched upon sufficiently to lay the foundation for the proper understanding of physiological functions.

Special attention is directed to the action of drugs and their effects upon the various systems.

## 2. QUALITATIVE AND QUANTITATIVE URINALYSIS (Post-Graduate)

PROFESSORS BEARD AND SEDGWICK

One credit (nine hours lecture, eighteen hours laboratory)

Second semester

Prerequisite, physiology 1.

Lectures, recitations and laboratory work. The laboratory work includes the qualitative analysis of representative specimens of urine as regards their physical properties, inorganic and organic constituents, as well as the quantitative determination of chlorides, urea, ammonia, total nitrogen, sugar and albumin, together with the preparation of reagents.

## 3. EXPERIMENTAL PHYSIOLOGY (Post-Graduate) PROFESSORS BEARD AND WILCOX

Four credits (thirty-six hours lecture, seventy-two hours laboratory)

Second semester

Prerequisite, physiology 2.

Laboratory work and demonstrations. A study of physiologic apparatus, electric stimuli and methods of experimentation; the demonstration and performance of experiments which illustrate physiologic function in the muscular, nervous, vascular, respiratory and glandular systems; and the study of the cardiac areas, the heart and respiratory sounds, and of pulse tracings including training in the use of sphygmograph, the stethoscope, phonendoscope, etc.

## 4. PHYSIOLOGICAL CHEMISTRY AND MICROSCOPY (Post-Graduate)

PROFESSORS BEARD, WILCOX, SEDGWICK AND DR. SCHLUTZ

Eight credits (seventy-two hours lecture, one hundred forty-four hours laboratory)

First semester

Prerequisite, physiology 3.

Laboratory work and demonstrations. A practical study of the several classes of proteids; of carbohydrates, fats, muscle and bone; of gastric juice, saliva, pancreatic juice and bile in their respective digestions; of glycogen, and of blood lymph, chyle and milk. Microscopic study of the carbohydrates in vegetable and animal forms; of the physiologic emulsions of fat; of the crystalline waste, products, and of the physiologic conditions of the blood cells and of blood crystals. Practical instruction is given during this course in the enumerations of the blood cells, in the estimation of haemoglobin and of the corpuscles in mass, in the spectroscopic examination of the blood in the determination of blood tests, and in the use of polariscope.

## MINNESOTA PHARMACY LAW

Several lectures elucidating the rights, duties, privileges and liabilities of pharmacists under the state law regulating the practice of pharmacy, are given by special lecturers near the close of the second year.

## SPECIAL LECTURES

From twelve to fifteen special lectures on subjects related to the practice of pharmacy are delivered by well-known pharmacists and others at intervals during the college year.

## LECTURE AND LABORATORY SCHEDULES

The work of the regular course for 1911-12 will be somewhat augmented. The changes will be posted on the college bulletin in September.

The college year is divided into four quarters, the first and second constituting the first semester, and the third and fourth the second semester. The college year covers nine full months or thirty-eight weeks. Each quarter consists of nine working weeks.

To the second and fourth quarters, one examination week is added.

# Students

## JUNIORS—44

|                                            |                                         |
|--------------------------------------------|-----------------------------------------|
| Anderson, Ingvald G., Atwater, Minn.       | Hanson, Hjalmar T., Eau Claire, Wis.    |
| Barber, Ralph C., Long Prairie, Minn.      | Hare, Heber R., Minneapolis             |
| Barnett, Samuel, St. Paul, Minn.           | Henney, Morris W., DeSmet, S. D.        |
| Beedy, Harry V., Minneapolis               | Holverson, Alice M., Alexandria, Minn.  |
| Benon, Louis, Minneapolis                  | Hutchinson, Roy, Duluth, Minn.          |
| Breckenridge, Clinton S., Pine City, Minn. | Knutson, Carol O., Finley, N. D.        |
| Brown, Lyle L., Crookston, Minn.           | Larson, George A., Atwater, Minn.       |
| Capron, Ralph E., Minneapolis              | McDonald, Bert, Hawley, Minn.           |
| Cannon, Raymond W., Minneapolis            | McDonald, Thomas A., Hawley, Minn.      |
| Carlson, Carl A., Garvin, Minn.            | Muehlbauer, Adolph A., St. Paul, Minn.  |
| Cutting, Charles P., Sleepy Eye, Minn.     | Olson, Alfred W., Argyle, Minn.         |
| Douhan, Alexander E., Minneapolis          | Onsum, Laura, Pelican Rapids, Minn.     |
| Dunham, Eugene, Faribault, Minn.           | Ostedt, Joseph H., St. Paul, Minn.      |
| Eaton, Roland C., Park Rapids, Minn.       | Perkins, Clarence A., Annandale, Minn.  |
| Fass, Joseph P., Sleepy Eye, Minn.         | Remington, Porter B., Minneapolis       |
| Finberg, Joseph, St. Paul, Minn.           | Rempel, Peter J., Butterfield, Minn.    |
| Gange, Lawrence, Mellette, S. D.           | Riley, Cusick M., Waukon, Iowa          |
| Goodwin, George E., Webster, S. D.         | Sands, Lillian S., Minneapolis          |
| Graham, Thomas E., Park Rapids, Minn.      | Schaffer, Leo L., Delano, Minn.         |
| Green, Frederic H., Hankinson, N. D.       | Steinke, Benjamin F., Sleepy Eye, Minn. |
| Gregoire, George, Eau Claire, Wis.         | Tagland, Orrin J., Rushford, Minn.      |
| Hamblett, Earl F., St. Charles, Minn.      | Witter, Henry R., Park Rapids, Minn.    |

## SENIORS—40

|                                        |                                             |
|----------------------------------------|---------------------------------------------|
| Adams, Edward M., Wayzata, Minn.       | Knatterud, Christian E., Spring Park, Minn. |
| Anderson, Ben G., Wheaton, Minn.       | Johnson, Theodore, Parkers Prairie, Minn.   |
| Ash, Ben S., Delano, Minn.             | Kusterman, Fred G., St. Cloud, Minn.        |
| Austin, Alberta J., Milbank, S. D.     | Laliberte, Wilfred, Crookston, Minn.        |
| Becker, Frank A., Olivia, Minn.        | Lillie, A. Laura, Rockford, Minn.           |
| Boardman, Roy J., Rochester, Minn.     | Marsh, Edward M., Pine Island, Minn.        |
| Broude, Samuel J., Minneapolis         | Meland, Richard B., Pelican Rapids, Minn.   |
| Bugbee, Guy C., Paynesville, Minn.     | Millard, Susan S., Breckenridge, Minn.      |
| Carlson, Helma, Erskine, Minn.         | Munro, Will R., Cummings, N. D.             |
| Carlson, Arthur E., Mankato, Minn.     | Nelson, Rex G., New Richland, Minn.         |
| Earle, Fred W., Rochester, Minn.       | Newsom, Alice P., Menomonie, Wis.           |
| Erickson, Oscar H., Canby, Minn.       | Peterson, Albert W., Litchfield, Minn.      |
| Gifford, Frank A., Madison Lake, Minn. | Ponthan, Marie W., St. Paul, Minn.          |
| Haynes, Manley H., Minneapolis         | Prevost, M. Estelle, Big Timber, Mont.      |
| Hughes, Stuart, Minneapolis            |                                             |

|                                             |                                           |
|---------------------------------------------|-------------------------------------------|
| Reynolds, Ross J., Barry, Minn.             | Steiner, Frank A., Mankato, Minn.         |
| Rood, Adolph F., Minneapolis                | Titus, James L., Berea, Ky.               |
| Schreiter, Norman C., Red Lake Falls, Minn. | Van Campen, Harry A., Cannon Falls, Minn. |
| Spiegel, Louis, Minneapolis                 | Weber, Frank J., Le Sueur Center, Minn.   |
| Spellman, Clyde A., Montevideo, Minn.       | Whittemore, A. A., Detroit, Minn.         |

## UNCLASSED—6

|                                  |                                              |
|----------------------------------|----------------------------------------------|
| Ashley, Norton N., Minneapolis   | Neuman, S. G., Duluth, Minn.                 |
| Bamberg, Julius P., Alton, Iowa  | Rosenthal, Joseph, Minneapolis               |
| Johnson, Archie O., Hudson, Wis. | Schroeder, William F., Lester Prairie, Minn. |

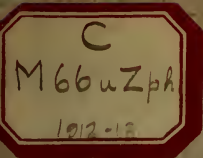












THE LIBRARY  
OF THE  
UNIVERSITY OF ILLINOIS

# The University of Minnesota

## THE COLLEGE OF PHARMACY

1912-1913



BULLETIN OF THE UNIVERSITY OF MINNESOTA

VOL. XV, NO. 3. MAY 1912

Entered at the Post Office  
in Minneapolis as second-class matter  
MINNEAPOLIS, MINN.

The University catalogues are published by authority of the Board of Regents, as a regular series of bulletins. One bulletin for each college and one for the Summer Session is published every year and in addition a bulletin of general information outlining the entrance requirements of all colleges of the University, and embodying such items as University equipment, organizations and publications, expenses of students, loan and trust funds, scholarships, prizes, etc. Bulletins will be sent gratuitously, postage paid, to all persons who apply for them. In calling for bulletins, the college or school of the University concerning which information is desired should be stated. Address,

THE REGISTRAR,

The University of Minnesota,

Minneapolis, Minnesota.



UNIVERSITY OF THE  
CITY OF ILLINOIS





MAP OF THE CAMPUS  
UNIVERSITY OF MINNESOTA  
Scale 1 inch = 200 feet

# The University of Minnesota

## THE COLLEGE OF PHARMACY

1912-1913



BULLETIN OF THE UNIVERSITY OF MINNESOTA

VOL. XV, NO. 3. MAY 1912

Entered at the Post Office  
in Minneapolis as second-class matter  
MINNEAPOLIS, MINN.

| 1912      |    |    |    |    |    |    | 1913     |    |    |    |    |    |    |           |    |    |    |    |    |    |
|-----------|----|----|----|----|----|----|----------|----|----|----|----|----|----|-----------|----|----|----|----|----|----|
| JULY      |    |    |    |    |    |    | JANUARY  |    |    |    |    |    |    | JULY      |    |    |    |    |    |    |
| Su        | Mo | Tu | W  | Th | Fr | Sa | Su       | Mo | Tu | W  | Th | Fr | Sa | Su        | Mo | Tu | W  | Th | Fr | Sa |
| ..        | 1  | 2  | 3  | 4  | 5  | 6  | ..       | .. | .. | 1  | 2  | 3  | 4  | ..        | .. | 1  | 2  | 3  | 4  | 5  |
| 7         | 8  | 9  | 10 | 11 | 12 | 13 | 5        | 6  | 7  | 8  | 9  | 10 | 11 | 6         | 7  | 8  | 9  | 10 | 11 | 12 |
| 14        | 15 | 16 | 17 | 18 | 19 | 20 | 12       | 13 | 14 | 15 | 16 | 17 | 18 | 13        | 14 | 15 | 16 | 17 | 18 | 19 |
| 21        | 22 | 23 | 24 | 25 | 26 | 27 | 19       | 20 | 21 | 22 | 23 | 24 | 25 | 20        | 21 | 22 | 23 | 24 | 25 | 26 |
| 28        | 29 | 30 | 31 | .. | .. | .. | 26       | 27 | 28 | 29 | 30 | 31 | .. | 27        | 28 | 29 | 30 | 31 | .. | .. |
| ..        | .. | .. | .. | .. | .. | .. | ..       | .. | .. | .. | .. | .. | .. | ..        | .. | .. | .. | .. | .. | .. |
| AUGUST    |    |    |    |    |    |    | FEBRUARY |    |    |    |    |    |    | AUGUST    |    |    |    |    |    |    |
| ..        | .. | .. | .. | 1  | 2  | 3  | ..       | 2  | 3  | 4  | 5  | 6  | 7  | 8         | 3  | 4  | 5  | 6  | 7  | 8  |
| 4         | 5  | 6  | 7  | 8  | 9  | 10 | 9        | 10 | 11 | 12 | 13 | 14 | 15 | 10        | 11 | 12 | 13 | 14 | 15 | 16 |
| 11        | 12 | 13 | 14 | 15 | 16 | 17 | 16       | 17 | 18 | 19 | 20 | 21 | 22 | 17        | 18 | 19 | 20 | 21 | 22 | 23 |
| 18        | 19 | 20 | 21 | 22 | 23 | 24 | 23       | 24 | 25 | 26 | 27 | 28 | .. | 24        | 25 | 26 | 27 | 28 | 29 | 30 |
| 25        | 26 | 27 | 28 | 29 | 30 | 31 | ..       | .. | .. | .. | .. | .. | .. | 31        | .. | .. | .. | .. | .. | .. |
| ..        | .. | .. | .. | .. | .. | .. | ..       | .. | .. | .. | .. | .. | .. | ..        | .. | .. | .. | .. | .. | .. |
| SEPTEMBER |    |    |    |    |    |    | MARCH    |    |    |    |    |    |    | SEPTEMBER |    |    |    |    |    |    |
| 1         | 2  | 3  | 4  | 5  | 6  | 7  | ..       | .. | .. | .. | .. | .. | 1  | ..        | 1  | 2  | 3  | 4  | 5  | 6  |
| 8         | 9  | 10 | 11 | 12 | 13 | 14 | 2        | 3  | 4  | 5  | 6  | 7  | 8  | 7         | 8  | 9  | 10 | 11 | 12 | 13 |
| 15        | 16 | 17 | 18 | 19 | 20 | 21 | 9        | 10 | 11 | 12 | 13 | 14 | 15 | 14        | 15 | 16 | 17 | 18 | 19 | 20 |
| 22        | 23 | 24 | 25 | 26 | 27 | 28 | 16       | 17 | 18 | 19 | 20 | 21 | 22 | 21        | 22 | 23 | 24 | 25 | 26 | 27 |
| 29        | 30 | .. | .. | .. | .. | .. | 23       | 24 | 25 | 26 | 27 | 28 | 29 | 28        | 29 | 30 | .. | .. | .. | .. |
| ..        | .. | .. | .. | .. | .. | .. | 30       | 31 | .. | .. | .. | .. | .. | ..        | .. | .. | .. | .. | .. | .. |
| OCTOBER   |    |    |    |    |    |    | APRIL    |    |    |    |    |    |    | OCTOBER   |    |    |    |    |    |    |
| ..        | .. | 1  | 2  | 3  | 4  | 5  | ..       | .. | 1  | 2  | 3  | 4  | 5  | ..        | .. | .. | 1  | 2  | 3  | 4  |
| 6         | 7  | 8  | 9  | 10 | 11 | 12 | 6        | 7  | 8  | 9  | 10 | 11 | 12 | 5         | 6  | 7  | 8  | 9  | 10 | 11 |
| 13        | 14 | 15 | 16 | 17 | 18 | 19 | 13       | 14 | 15 | 16 | 17 | 18 | 19 | 12        | 13 | 14 | 15 | 16 | 17 | 18 |
| 20        | 21 | 22 | 23 | 24 | 25 | 26 | 20       | 21 | 22 | 23 | 24 | 25 | 26 | 19        | 20 | 21 | 22 | 23 | 24 | 25 |
| 27        | 28 | 29 | 30 | 31 | .. | .. | 27       | 28 | 29 | 30 | .. | .. | .. | 26        | 27 | 28 | 29 | 30 | 31 | .. |
| ..        | .. | .. | .. | .. | .. | .. | ..       | .. | .. | .. | .. | .. | .. | ..        | .. | .. | .. | .. | .. | .. |
| NOVEMBER  |    |    |    |    |    |    | MAY      |    |    |    |    |    |    | NOVEMBER  |    |    |    |    |    |    |
| ..        | .. | .. | .. | .. | 1  | 2  | ..       | .. | .. | .. | 1  | 2  | 3  | ..        | .. | .. | .. | .. | .. | 1  |
| 3         | 4  | 5  | 6  | 7  | 8  | 9  | 4        | 5  | 6  | 7  | 8  | 9  | 10 | 2         | 3  | 4  | 5  | 6  | 7  | 8  |
| 10        | 11 | 12 | 13 | 14 | 15 | 16 | 11       | 12 | 13 | 14 | 15 | 16 | 17 | 9         | 10 | 11 | 12 | 13 | 14 | 15 |
| 17        | 18 | 19 | 20 | 21 | 22 | 23 | 18       | 19 | 20 | 21 | 22 | 23 | 24 | 16        | 17 | 18 | 19 | 20 | 21 | 22 |
| 24        | 25 | 26 | 27 | 28 | 29 | 30 | 25       | 26 | 27 | 28 | 29 | 30 | 31 | 23        | 24 | 25 | 26 | 27 | 28 | 29 |
| ..        | .. | .. | .. | .. | .. | .. | ..       | .. | .. | .. | .. | .. | .. | 30        | .. | .. | .. | .. | .. | .. |
| DECEMBER  |    |    |    |    |    |    | JUNE     |    |    |    |    |    |    | DECEMBER  |    |    |    |    |    |    |
| 1         | 2  | 3  | 4  | 5  | 6  | 7  | 1        | 2  | 3  | 4  | 5  | 6  | 7  | 7         | 1  | 2  | 3  | 4  | 5  | 6  |
| 8         | 9  | 10 | 11 | 12 | 13 | 14 | 8        | 9  | 10 | 11 | 12 | 13 | 14 | 8         | 9  | 10 | 11 | 12 | 13 | 14 |
| 15        | 16 | 17 | 18 | 19 | 20 | 21 | 15       | 16 | 17 | 18 | 19 | 20 | 21 | 14        | 15 | 16 | 17 | 18 | 19 | 20 |
| 22        | 23 | 24 | 25 | 26 | 27 | 28 | 22       | 23 | 24 | 25 | 26 | 27 | 28 | 21        | 22 | 23 | 24 | 25 | 26 | 27 |
| 29        | 30 | 31 | .. | .. | .. | .. | 29       | 30 | .. | .. | .. | .. | .. | 28        | 29 | 30 | 31 | .. | .. | .. |



# UNIVERSITY CALENDAR

1912-1913

The University year covers a period of thirty-eight weeks, beginning on the second Tuesday in September. Commencement Day is always the second Thursday in June.

1912

|           |       |           |                                                                                           |
|-----------|-------|-----------|-------------------------------------------------------------------------------------------|
| September | 3     | Tuesday   | Registration closes except for new students                                               |
| September | 3-10  | Week      | Fees payable except for new students                                                      |
| September | 10-16 | Week      | Examinations for removal of conditions, registration of new students, and payment of fees |
| September | 11-17 | Week      | Military encampment of cadets                                                             |
| September | 18    | Wednesday | First semester begins                                                                     |
| November  | 27    | Wednesday | Thanksgiving recess begins 6:00 p. m.                                                     |
| December  | 2     | Monday    | Thanksgiving recess ends 8:00 a. m.                                                       |
| December  | 20    | Friday    | Christmas vacation begins 6:00 p. m.                                                      |

1913

|          |    |           |                                            |
|----------|----|-----------|--------------------------------------------|
| January  | 7  | Tuesday   | Christmas vacation ends 8:00 a. m.         |
| January  | 21 | Tuesday   | Registration for second semester closes    |
| January  | 27 | Monday    | Final examinations begin                   |
| January  | 28 | Tuesday   | Payment of fees for second semester closes |
| February | 5  | Wednesday | Second semester begins                     |
| February | 12 | Wednesday | Lincoln's Birthday: a holiday              |
| February | 13 | Thursday  | First semester class reports due           |
| February | 22 | Saturday  | Washington's Birthday: a holiday           |
| March    | 19 | Wednesday | Easter recess begins 6:00 p. m.            |
| March    | 27 | Thursday  | Easter recess ends 8:00 a. m.              |
| May      | 30 | Friday    | Decoration Day: a holiday                  |
| June     | 2  | Monday    | Final examinations begin                   |
| June     | 7  | Saturday  | Second semester closes                     |
| June     | 8  | Sunday    | Baccalaureate service                      |
| June     | 9  | Monday    | Senior class day exercises                 |
| June     | 11 | Wednesday | Alumni Day                                 |
| June     | 12 | Thursday  | Forty-first Annual Commencement            |
| June     | 13 | Friday    | Summer vacation begins                     |

The University year for 1913-14 will begin Tuesday, September 9.



*Program of Entrance Examinations 1912-13*

Entrance examinations for admission to the various colleges of the University will be conducted according to the following schedule, in Room 205, Library Building, unless otherwise specified.

Any student finding a conflict in his program should report to the Registrar for adjustment.

|                     |          |         |                                                                        |
|---------------------|----------|---------|------------------------------------------------------------------------|
| Tuesday,            | Sept. 10 | 9 a. m. | Astronomy, Botany, Geology, Chemistry, Physiography, Zoology           |
|                     |          | 2 p. m. | American Government, History, Physics, Economics, Commercial Geography |
| Wednesday, Sept. 11 |          | 9 a. m. | English                                                                |
|                     |          | 2 p. m. | German, French, Latin, Scandinavian                                    |
| Thursday, Sept. 12  |          | 9 a. m. | Elementary Algebra                                                     |
|                     |          | 2 p. m. | Higher Algebra                                                         |
| Friday, Sept. 13    |          | 9 a. m. | Plane Geometry                                                         |
|                     |          | 2 p. m. | Solid Geometry                                                         |

A representative of each department will be at the office of the head of the department each forenoon of entrance examination week from 9 to 12 to give information and advice.

## THE UNIVERSITY

THE UNIVERSITY OF MINNESOTA comprises the following named schools, colleges, and departments:

THE COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

THE COLLEGE OF ENGINEERING AND THE MECHANIC ARTS

THE DEPARTMENT OF AGRICULTURE, including—

THE COLLEGE OF AGRICULTURE

THE COLLEGE OF FORESTRY, including—

FOREST EXPERIMENT STATIONS AT ITASCA AND CLOQUET

THE SCHOOL OF AGRICULTURE including—

THE DAIRY SCHOOL

THE SHORT COURSE FOR FARMERS

TEACHERS' SUMMER TRAINING SCHOOL

THE SCHOOL OF TRACTION ENGINEERING

THE SCHOOL OF AGRICULTURE, CROOKSTON

THE SCHOOL OF AGRICULTURE, MORRIS

THE EXPERIMENT STATIONS, including—

THE MAIN STATION AT ST. ANTHONY PARK

THE SUB-STATION AT CROOKSTON

THE SUB-STATION AT GRAND RAPIDS

THE SUB-STATION AT DULUTH

THE SUB-STATION AT WASECA

THE SUB-STATION AT ZUMBRA HEIGHTS

AGRICULTURAL EXTENSION

BUREAU OF RESEARCH IN AGRICULTURAL ECONOMICS

THE LAW SCHOOL

THE COLLEGE OF MEDICINE AND SURGERY, including—

THE SCHOOL FOR NURSES

THE COLLEGE OF DENTISTRY

THE COLLEGE OF PHARMACY

THE SCHOOL OF MINES, including—

MINNESOTA SCHOOL OF MINES EXPERIMENT STATION

THE SCHOOL OF ANALYTICAL AND APPLIED CHEMISTRY

THE COLLEGE OF EDUCATION

THE GRADUATE SCHOOL

---

THE GEOLOGICAL AND NATURAL HISTORY SURVEY

## THE BOARD OF REGENTS

|                                                         |   |   |                   |
|---------------------------------------------------------|---|---|-------------------|
| The Hon. JOHN LIND, Minneapolis, President of the Board | - | - | 1914              |
| GEORGE EDGAR VINCENT, Ph.D., LL.D., Minneapolis         | - | - | <i>Ex-Officio</i> |
| The President of the University                         |   |   |                   |
| The Hon. ADOLPH O. EBERHART, Mankato                    | - | - | <i>Ex-Officio</i> |
| The Governor of the State                               |   |   |                   |
| The Hon. C. G. SCHULZ, St. Paul                         | - | - | <i>Ex-Officio</i> |
| The State Superintendent of Public Instruction          |   |   |                   |
| The Hon. W. J. MAYO, Rochester                          | - | - | 1913              |
| The Hon. MILTON M. WILLIAMS, Little Falls               | - | - | 1913              |
| The Hon. HENRY B. HOVLAND, Duluth                       | - | - | 1914              |
| The Hon. A. E. RICE, Willmar                            | - | - | 1915              |
| The Hon. CHARLES L. SOMMERS, St. Paul                   | - | - | 1915              |
| The Hon. B. F. NELSON, Minneapolis                      | - | - | 1916              |
| The Hon. PIERCE BUTLER, St. Paul                        | - | - | 1916              |
| The Hon. CHARLES A. SMITH, Minneapolis                  | - | - | 1916              |

---

## EXECUTIVE OFFICERS

GEORGE EDGAR VINCENT, Ph.D., LL.D., President  
 ERNEST B. PIERCE, B.A., Registrar  
 GEORGE H. HAYES, University Comptroller and Secretary of the Board of Regents  
 JAMES T. GEROULD, B.A., Librarian  
 JOHN F. DOWNEY, M.A., C.E., Dean of the College of Science, Literature, and the Arts  
 FRANCIS C. SHENEHON, C.E., Dean of the College of Engineering and Mechanic Arts  
 ALBERT F. WOODS, M.A., Dean and Director of the Department of Agriculture  
 WILLIAM R. VANCE, Ph.D., LL.B., Dean of the Law School  
 FRANK FAIRCHILD WESBROOK, M.A., M.D., C.M., Dean of the College of Medicine and Surgery  
 ALFRED OWRE, B.A., M.D., C.M., D.M.D., Dean of the College of Dentistry  
 FREDERICK J. WULLING, Ph.D., LL.M., Dean of the College of Pharmacy  
 WILLIAM R. APPLEBY, M.A., Dean of the School of Mines  
 GEORGE B. FRANKFORTER, M.A., Ph.D., Dean of the School of Chemistry  
 GEORGE F. JAMES, Ph.D., Dean of the College of Education  
 HENRY T. EDDY, C.E., Ph.D., LL.D., Dean of the Graduate School  
 ADA L. COMSTOCK, M.A., Dean of Women

# THE COLLEGE OF PHARMACY

## FACULTY

- GEORGE EDGAR VINCENT, Ph.D., LL.D., President 1005 5th St. S. E.  
 CYRUS NORTHROP, LL.D., President Emeritus 519 10th Ave. S. E.  
 FREDERICK J. WULLING, Phm.D., LL.M., Dean, Professor of Pharmacology, and Director of the University Medicinal Plant Gardens  
 3305 2nd Ave. S.  
 RICHARD OLDING BEARD, M.D., Professor of Physiology  
 The Virginia, Lowry Hill  
 CHARLES F. SIDENER, B.S., Professor of Quantitative Chemistry  
 1320 5th St. S. E.  
 GEORGE B. FRANKFORTER, M.A., Ph.D., Professor of Chemistry  
 525 E. River Road  
 FRANK F. WESBROOK, M.A., M.D., C.M., Professor of Bacteriology  
 906 5th St. S. E.  
 EVERHART P. HARDING, M.S., Ph.D., Assistant Professor of Chemistry  
 1316 7th St. S. E.  
 M. RUSSELL WILCOX, M.D., Assistant Professor of Physiology  
 802 Donaldson Bldg.  
 IRA HARRIS DERBY, Ph.D., Assistant Professor of Chemistry  
 2157 Commonwealth Ave., St. Paul  
 FREDERIC E. CLEMENTS, Ph.D., Professor of Botany 800 4th St. S. E.  
 EDGAR D. BROWN, Phm.D., M.D., Professor of Materia Medica and Therapeutics  
 3525 3rd Ave. S.  
 ..... Professor of Pharmacognosy  
 FREDERIC K. BUTTERS, B.S., B.A., Assistant Professor of Botany  
 815 S. 7th St.  
 FREDERICK H. SCOTT, Ph.D., M.B., D.Sc., Assistant Professor of Physiology  
 1023 University Ave. S. E.  
 FRANK F. GROUT, M.S., Assistant Professor of Geology and Mineralogy  
 1202 7th St. S. E.  
 GUSTAV BACHMAN, Phm. D., Phm.M., Instructor in Pharmacy  
 2624 Fremont Ave. S.  
 OSCAR BLOSMO, Ph.C., Instructor in Dispensing 529 Oak St. S. E.  
 CHARLES F. DIGHT, M.D., Lecturer in Materia Medica  
 4818 39th Ave. S.  
 JOHN A. HANDY, Ph.C., B.S., Instructor in Pharmaceutical Chemistry  
 803 University Ave. S. E.

- MANLEY H. HAYNES, Phm. B., Assistant in Pharmacognosy  
703 E. River Road
- WILLIAM H. HUNTER, Ph.D., Instructor in General and Qualitative  
Chemistry 112 Church St. S. E.
- JOHN ELDON HYNES, Ph.C., M.D., Assistant in Clinical Microscopy  
3349 University Ave. S. E.
- C. NAUMANN MCCLOUD, Phm.D., M.D., Lecturer on First Aids to the  
Injured 524 Lowry Bldg., St. Paul
- ALICE M. MISZ, M.A., Instructor in Botany 651 Otsego St., St. Paul
- EDWIN L. NEWCOMB, P.D.; Instructor in Pharmaceutical Botany and  
Pharmacognosy 719 6th Ave. S. E.
- HAROLD E. ROBERTSON, B.A., M.D., Instructor in Clinical Microscopy  
508 Essex St. S. E.
- FREDERIC W. SCHLUTZ, B.A., M.D., Instructor in Physiological Chemistry  
802 Donaldson Bldg.
- WALTER D. SHELDEN, B.S., M.D., Instructor in Therapeutics  
3233 Irving Ave. S.
- .....Instructor in Pharmaceutical Latin
- .....Assistant in Materia Medica

## SPECIAL LECTURERS

- |                  |              |                  |
|------------------|--------------|------------------|
| W. A. FROST      | W. G. NOYES  | A. D. THOMPSON   |
| STEWART GAMBLE   | A. J. KLINE  | E. A. TUPPER     |
| J. W. HARRAH     | C. B. MCCALL | THOMAS VOEGELI   |
| CHARLES H. HUHNS | HENRY MCCOLL | JUSTIN S. BREWER |



## GENERAL INFORMATION

### ADMISSION

#### *A. To the Two-Year Course*

While nearly all the students enrolled in this College are graduates of full four-year high school courses, such a training prior to entrance is not obligatory at the present time. The requirements, however, are being raised gradually in such a way that soon they shall be a full high school preparation or its equivalent for all matriculants.

- I. Applicants may be admitted without examination if they bring certificates of graduation from, or standing in, institutions of collegiate grade or present other credentials showing that they have successfully completed the branches of study embraced in a full four-year high school course, or an equivalent, provided that among the branches completed are:

English, two years, including the principles of composition and practice in written expression.

Algebra, one year, elementary, up to beginning of Higher Algebra.

Geometry, one year, elementary.

Physics, one year, elementary.

Latin, two years: grammar, one year; Caesar (four books), one year. Two years of a modern language may be substituted for the second year of Latin.

- II. Other applicants must pass examinations in the branches above specified, i. e., in English, Algebra, Geometry, Physics, and Latin or present satisfactory evidence of having completed these branches for which substitutes cannot be accepted.

Students will be allowed to carry not more than two conditions, which, however, must be removed before the final examinations in the first-year subjects.

In certain cases credit is given for drug store experience.

#### *B. To the Three-Year Course*

The minimum requirements for admission to the three-year course are the same as those for admission to the two-year course II, with the exception that students may carry as conditions not more than three of the entrance subjects, one of which cannot be English. Students must pursue the branches in which they are conditioned during their first year and pass examinations in them or present evidence of having satisfactorily completed the branches. The subjects are not taught at the College but may be taken at the academy near by, or at the city high schools or with private tutors. The University Y. M. C. A. usually establishes courses for the benefit of students conditioned in entrance branches.

Applicants whose preparatory course of study has not conformed precisely to the requirements above enumerated will be allowed to offer, in lieu of a portion of these requirements, equivalent preparation in similar branches of study; and if they show by examination, or by other evidence, that their preparation has been substantially equivalent, such branches will be accepted as substitutes for those omitted.

The examinations for entrance are conducted by the Faculty of the College of Pharmacy, beginning at 9:00 a. m., on Tuesday, September 17, 1912. Lecture work begins as soon as possible after the examinations, usually the following day.

Every applicant is required to furnish a certificate of good moral character.

Those who do not pass the entrance examinations in not more than three of the required subjects, may enter and complete their course in three years, provided they pursue the subjects required for admission in addition to the professional work that may be assigned to them, and pass their entrance examinations, before the end of the first year.

### REGISTRATION

Registration begins September 10th. All applicants for admission to the regular courses must present to the Dean not later than September 16th, their school or high school certificates, diplomas, or such other credentials as they may wish to offer toward meeting in whole or in part the entrance requirements. If these are found satisfactory, the applicant will fill out the necessary registration blanks and present them in the office of the University Registrar, who will issue to him a statement of fees, including tuition fee, microscope rental, and general deposit fee. The applicant will pay the fees indicated to the Cashier and receive receipts therefor. Registration is completed by depositing these receipts in the office of the Dean. The student is then classified.

### ADVANCED STANDING

Applicants for advanced standing must pass the entrance examinations or present the usual equivalents. They must furnish satisfactory evidence of time spent and subjects covered in previous professional studies, and must pass the examinations of all departments in which they wish to be exempt, if such examinations are deemed necessary by the professors in charge. Students will not be permitted to substitute private work in any branch for the regular course work.

### UNCLASSED STUDENTS

Unclassed or special students may enter at any time providing there is laboratory room for them. They will not be rated on their work nor examined unless they make special request therefor. Work completed will be credited should the student subsequently enter the regular course.

## EXAMINATIONS AND STANDINGS

Examinations are held at the end of the regular school year and during the last week of the first semester, and are supplementary to the written tests and quizzes that are held at frequent intervals during the year, and with them form largely the basis of final determination of fitness for promotion or graduation. Students are rated throughout the year, and all who have a standing of ninety per cent, or more, in certain of the branches, may not be required to take the final examination in those branches.

Students are not required to write graduating theses, but instead they keep complete records of their laboratory work. The records are to be kept in substantially bound books, to be approved by the Faculty. The respective professors call for the records for inspection and rating once a month or oftener. Duplicates of records are to be furnished the College by the students. The College provides the paper.

The standing of students is determined by the results of recitations, written examinations, laboratory work and attendance. It is indicated by the terms *excellent*, *passed*, *conditioned*, *incomplete*, or *failed*. Conditions may be removed as indicated below. Incomplete work must be made up before the final examinations of the following year.

In order to become eligible for final examinations, students are required to attend at least four-fifths of the lectures in each course. This rule is not intended for the benefit of those who seek admission after the opening of the college year, but is designed to cover cases of sickness or unavoidable absence. It does not apply to laboratory courses which must be taken in full and must be entered during the first week in which they begin.

Students having conditions in more than two major or in more than three minor subjects of the first year cannot enter upon the second year's work. All entrance conditions must be removed before the next spring examination. Candidates for graduation must have removed all conditions before entering upon the second semester of the graduating year.

Condition examinations are held during the first week of the course in September. The dates are usually posted in June. Conditioned students are required to inform themselves as to these dates as soon as they learn that they are conditioned, as no other notice is given.

A fee of one dollar is charged for a second condition examination.

Failure at the second condition obliges the student to repeat the work of the respective course.

Students who carry a condition into a succeeding year may find a conflict of lecture or laboratory hours. In such cases they are to give preference to the lower course.

Absence will not be excused unless satisfactory reasons are given to the professor in charge. Habitual absence without a satisfactory excuse, continued indifference to study, or persistently poor scholarship may subject the student to temporary or permanent suspension. Students are earnestly requested to be present at the beginning of the school

year, but those who cannot enter in the fall may enter at the beginning of the second semester taking any of the subjects beginning then. Any of the facilities for work in the University are open to the students of this College, subject to the approval of the Dean. Opportunity is afforded to do advanced work in all branches. Text-books may be obtained after coming to the University.

The work of the College, as outlined in the following pages, is conducted by means of lectures, recitations, and laboratory exercises. Students find their time fully occupied. Those who feel unable to complete the work in two years may divide it in a manner to complete it in three years. Practicing pharmacists who desire to take certain branches of study may avail themselves of any of the college facilities.

### GRADUATION REQUIREMENTS

Regular attendance at lectures, recitations, and laboratory exercises is required. Students will not be permitted to present themselves for final examination unless they have been in attendance upon at least seven-eighths of the total of work.

Every person upon whom the degree is conferred must be of good moral character and must be at least twenty-one years old; must have attended two full lecture and laboratory courses, the last at this College, and must have passed a successful examination in the subjects required for graduation.

Drug store experience is not a requirement for graduation.

Those who fail to appear for examination after having paid their full fee, or those who do not pass satisfactorily, will be permitted to present themselves at any subsequent examination, upon payment of an additional fee of five dollars, and complying with all other requirements.

### DEGREES

The College confers the degree of Bachelor of Pharmacy, Master of Pharmacy, and Doctor of Pharmacy for the completion of respectively the regular and the two graduate courses.

### FEEES

#### *Two-Year Regular Course*

|                          |         |               |
|--------------------------|---------|---------------|
| First-year tuition.....  | \$82.50 |               |
| Second-year tuition..... | 82.50   |               |
|                          |         | —————\$165.00 |

#### *Three-Year Regular Course*

|                                                      |         |               |
|------------------------------------------------------|---------|---------------|
| First-year tuition.....                              | \$55.00 |               |
| Second-year tuition.....                             | 55.00   |               |
| Third-year tuition.....                              | 55.00   |               |
|                                                      |         | —————\$165.00 |
| Annual deposit covering all laboratories, etc.....   | \$5.00  |               |
| Second condition examination fee, each subject ..... | 1.00    |               |



*First Graduate Course*

|                                    |         |
|------------------------------------|---------|
| Tuition for each semester. . . . . | \$10.00 |
| Annual deposit. . . . .            | 5.00    |

There are no other tuition fees. Fees are payable at the time of registration. Those desiring to take special work will be required to pay an average of ten dollars a subject for the lecture courses and twenty-five dollars for the laboratory courses.

Students are to provide themselves with a designated set of metric weights, a set of apothecary's weights, steel spatulas, and note and drawing books. The expense of these may be kept within three dollars. Students using platinum crucibles are charged for them. Upon the return of the crucible in the original condition the charge is cancelled; if the crucible is in any wise damaged the full value is collected from the student.

Fees will not be returned, except in case of discontinuance for sufficient reason before the student has been assigned to a place in the laboratory.

A deposit of five dollars will be made with the Cashier each year, by every student, at the time of enrollment as a caution fee. The fee is intended to cover the cost of unnecessary damage to or in the college buildings and of breakage and loss of laboratory apparatus, material, penalties for late registration or late payment of fees, condition examinations, and the rental of post-office box, locker, etc. The unused balance will be returned to the student at the close of each year. If responsibility for such damage cannot be individually fixed, a pro rata charge upon all students will be made.

In each laboratory course the student will be assigned a certain amount of apparatus and material, for which he will give a receipt. At the end of each course, if such apparatus and material are restored in good condition, this receipt will be returned to him. All apparatus lost or damaged will be charged to him, and must be paid for before he can receive credits for his course, or take his annual examinations.

## COLLEGE TRAINING FOR PHARMACISTS

The recognition of the need of substantial college training for pharmacists finds expression in many ways. In New York, Pennsylvania, Hawaii, Wisconsin, Ohio, Louisiana, and Washington, such training is obligatory either by law or by rule of the boards of pharmacy. In a number of other states credit is given for college work. In Minnesota graduates from recognized colleges need to have had only two years of practical experience while all others must have had four years of drug store experience before they become eligible for examination by the State Board of Pharmacy for full license to practice in Minnesota. Graduates of the three-year course who have gained practical experience concurrently with their college work need only one additional year of drug store experience before they become eligible for examination for full registration.



At the Joint Conference of the National Association of Boards of Pharmacy and the American Conference of Pharmaceutical Faculties, held at Indianapolis, Indiana, in September, 1906, the following resolution was adopted:

"Special education for the practice of pharmacy is in this age a necessity and should as rapidly as possible be made compulsory. The rules of the boards of pharmacy are such as to promote and encourage it in all practicable ways. The special pharmaceutical education should include substantial laboratory courses." The training advocated by these two most representative bodies and by the American Pharmaceutical Association can be obtained only at colleges or schools of pharmacy of recognized standing. It is admitted that the State of Minnesota through its University College of Pharmacy is affording instruction of the most approved kind.

In the organization of this college the Board of Regents and the Faculty have had the co-operation of the pharmacists of the State. The character of instruction is of high order and every effort is made to comply with the demands of the profession of the Northwest, or elsewhere, in the maintenance of a course of instruction of the highest grade.

#### POSITIONS FOR GRADUATES

The demand for graduates of this College has always been greater than the supply and is continually growing. The rule is that practically all of the senior class are engaged before graduation. This college is recognized in all states, including those in which standards of efficiency have been established.

#### STATE BOARD OF PHARMACY

The State Board of Pharmacy meets at the College four times each year to examine candidates for registration. For information concerning the Board or State examinations, address the Secretary of the Board, Mr. E. A. Tupper, 721 South 10th St., Minneapolis, Minnesota.

#### COLLEGE OF PHARMACY ALUMNI ASSOCIATION

The Alumni Association of the College of Pharmacy meets annually in the college building the day before Commencement, at 3 p. m. Every member of the Association is urgently requested to report change of address to the Secretary.

#### THE AMERICAN CONFERENCE OF PHARMACEUTICAL FACULTIES

The College of Pharmacy of the University of Minnesota is one of the colleges constituting the membership of the American Conference of Pharmaceutical Faculties.

## COMMUNICATIONS

Address communications to the Dean, Professor Frederick J. Wulling, The University of Minnesota, Minneapolis, Minnesota.

## PHI DELTA CHI

The Theta chapter of the Phi Delta Chi fraternity was organized at the College of Pharmacy in 1904. Students of the college are eligible to membership.

THE NORTHWESTERN BRANCH OF THE AMERICAN  
PHARMACEUTICAL ASSOCIATION

The Northwestern Branch of the American Pharmaceutical Association, composed of the representative pharmacists of the Northwest, has its headquarters at the College of Pharmacy. About four meetings are held annually. Students of pharmacy are eligible to membership in the Branch, but are privileged to attend the meetings without becoming members.

## COURSES OF STUDY

Three courses are offered, the regular and two graduate courses.

The complete regular course extends over two years of nine full months each. Students may arrange their work so as to take the course in three years. The twenty-first annual course begins on September 16, 1912, which is the last day on which students in pharmacy may register without a fine. The office of the Registrar is open for the purpose of registration as early as September 10th, but students must first report at the Dean's office in the pharmacy building.

In addition to the regular course this College offers two graduate courses, the first continuing through one college year and leading to the degree of Master of Pharmacy and the second continuing through an additional year or longer, and leading to the degree of Doctor of Pharmacy. The first graduate course, the one leading to the master's degree, is now in operation. The curriculum includes higher pharmaceutical chemistry, pharmaceutical assaying, higher organic chemistry, proximate and ultimate analysis, chemistry of food, water analysis, toxicology, spectroscopic work, therapeutics, clinical microscopy and bacteriology, and a thesis of at least 3,000 words, embodying the results of original work, but this curriculum may be changed by the Faculty if occasion or experience require.

The requirements for admission to the first graduate course are a diploma from a Minnesota High School of the first grade, or an equivalent; a diploma from a college of pharmacy whose curriculum, extent and kind of work and length of undergraduate course are equal to those of this college; an acquaintance with either German or French sufficient to enable the student to read and understand the scientific literature of those languages. The fees for this course are ten dollars per semester. The rules relating to damage, waste, and breakage in laboratories are the same as those applying to the undergraduate course.

The course leading to the doctor's degree will begin as soon as there are sufficient applicants.

## PROPOSED NEW COURSES

Beginning as soon as the proposed enlarged quarters of the College permit, two additional courses may be instituted: the one a lower and shorter than the regular course to conform to the minimum requirements of the American Conference of Pharmaceutical Faculties; the other, a higher than the regular course to lead to the degree of Bachelor of Science in Pharmacy, and to include four years of work. The details have not yet been worked out, but it is probable that the former will include about two-thirds of the work of the regular course and will cover two years of at least six months each and that the entrance requirements will include the first year in high school or equivalent training or whatever the entrance requirements of the Conference may be at the time.

The higher course will cover four years of nine months each and will include two years of academic and cultural work. The qualifications for entrance to this course will be the same as those required for entrance to the College of Science, Literature, and the Arts. Those presenting evidence of having completed the first two years of a collegiate course may complete the course in two years, providing the collegiate work completed includes certain subjects in the sciences and mathematics. Full announcement regarding these courses will be made duly.

## COURSES OF INSTRUCTION COMPRISING THE REGULAR PHARMACY COURSE

### FIRST YEAR

#### *First Quarter*

Botany 1, Comparative Morphology of the Cryptogams, six hours  
Pharmacy 9, Chemical Philosophy, five hours  
Pharmacy 1, History of Pharmacy; Pharmacy 2, Metrology; and Pharmacy 3, Physics of Pharmacy, six hours.  
Chemistry 1, General, fifteen hours

#### *Second Quarter*

Botany 1, Comparative Morphology of the Cryptogams, six hours  
Pharmacy 10, Pharmaceutical Chemistry of the Non-Metals and their Preparations, three hours  
Pharmacy 3, Physics of Pharmacy, six hours  
Pharmacy 7, Pharmacy Quiz, one hour  
Chemistry 2, Qualitative Analysis, fifteen hours

#### *Third Quarter*

Botany 2, Morphology, Anatomy, and Classification of Higher Seed Plants, six hours  
Pharmacy 11, Pharmacopoeial Inorganic Salts and their Official Preparations, two hours  
Pharmacy 4, Pharmaceutical Processes, and Pharmacy 5, Pharmacopoeial Preparations, eight hours  
Pharmacognosy 1, Pharmacognosy of the Cryptogams, and Pharmacognosy 2, Pharmaco-Histology, three hours  
Pharmacy 7, Pharmacy Quiz, one hour  
Materia Medica 1, Inorganic Materia Medica, three hours  
Chemistry 5, Organic Chemistry, fifteen hours

#### *Fourth Quarter*

Botany 2, Morphology, Anatomy, and Classification of Higher Seed Plants, six hours  
Pharmacy 11, Pharmacopoeial Inorganic Salts and their Official Preparations, two hours  
Materia Medica 1, Inorganic Materia Medica, three hours

Pharmacy 5, Pharmacopoeial Preparations, and Pharmacy 6, Mathematics of Pharmacy, nine hours  
 Pharmacy 7, Pharmacy Quiz, two hours  
 Pharmacy 8, Identification of Inorganic Official Preparations, one hour  
 Pharmacognosy 1, Pharmacognosy of the Cryptogams, and Pharmacognosy 2, Pharmacology, three hours  
 Chemistry 5, Organic Chemistry, fifteen hours

## SECOND YEAR

### *First Quarter*

Pharmacy 12, Classification of Pharmaceutical Organic Compounds,  
 Pharmacy 13, Chemistry of the Pharmacopoeial Organic Compounds  
 and their Preparations, two hours  
 Pharmacy 14, Pharmacopoeial Testing, sixteen hours  
 Pharmacognosy 3 and 4, Pharmacognosy of the Angiosperms, and Pharmacognosy 5, Field Work, six hours  
 Pharmacy 23, Identification of Salts, one hour  
 Pharmacy 16, Incompatibility, and Pharmacy 17, Dispensing, twenty hours  
 Materia Medica 2, Organic Materia Medica, three hours

### *Second Quarter*

Pharmacy 13, Chemistry of the Pharmacopoeial Organic Compounds  
 and their Preparations, two hours  
 Pharmaceutical Mineralogy and Crystallography 1, four hours  
 Pharmacognosy 3 and 4, Pharmacognosy of the Angiosperms, and Pharmacognosy 5, Field Work, six hours  
 Pharmacy 18, Manufacture of Official Organic and Inorganic Salts and Preparations, fourteen hours  
 Pharmacy 14, Pharmacopoeial Testing, ten hours  
 Pharmacy 23, Identification of Salts, one hour

### *Third Quarter*

Pharmacognosy 3 and 4, Pharmacognosy of the Angiosperms, and Pharmacognosy 5, Field Work, nine hours  
 Chemistry 3, Quantitative Analysis, nine hours  
 Pharmacy 23, Identification of Salts, one hour  
 Pharmacy 13, Chemistry of the Pharmacopoeial Organic Compounds  
 and their Preparations, two hours  
 Pharmacy 19, National Formulary, fifteen hours  
 Therapeutics 3, Therapeutics, one hour  
 Physiology 1, Physiology, Anatomy, and Histology, two hours

### *Fourth Quarter*

Pharmacy 15, Quantitative Analysis of U. S. P. Salts and Preparations, five hours



Pharmacy 13, Chemistry of the Pharmacopoeial Organic Compounds and their Preparations, one hour

Pharmacy 23, Identification of Salts, one hour

Pharmacognosy 3 and 4, Pharmacognosy of the Angiosperms, and Pharmacognosy 5, Field Work, nine hours

Pharmacy 20, Pharmaceutical Assay; Pharmacy 21, Synthetic Remedies; Pharmacy 22, Homeopathic Pharmacy, and Pharmacy 24, Microchemistry, ten hours

Pharmacy Law, one and one-half hours

First Aids, one and one-half hours

# DEPARTMENTAL<sup>1</sup> STATEMENTS

## BACTERIOLOGY

### 1. General Bacteriology (Postgraduate) Dr. WESBROOK

Twelve lecture and recitation hours, and twelve laboratory hours per week; second year, fourth quarter.

Lectures and demonstrations. The general scope of bacteriology, the history of its development, and the biological and chemical problems involved in the life history of bacteria will be dealt with. The classification of the various bacterial forms, the methods of isolation and culture, and the composition and manufacture of culture media will be studied until a thorough knowledge of technique is acquired. General and special study of the various antiseptics, disinfectants, and bactericidal substances and conditions will be undertaken.

Laboratory work, involving the making of their own culture media by the students, the study of bacteria in cultures and under the microscope, technique of staining and other methods, including observations of chemical and biological peculiarities, will be thoroughly carried out. Testing of various germicides—chemical and physical—and the use of bacteriological methods in the examination of drinking water will form an important part of the work.

## BOTANY AND MICROSCOPY

FREDERIC E. CLEMENTS, Ph.D., Professor of Botany

FREDERIC K. BUTTERS, B.S., B.A., Assistant Professor of Botany

ALICE MISZ, M.A., Instructor in Botany

..... Assistant

1, 2, and 3: ten credits (seventy-two hours lecture, one hundred forty-four hours laboratory); first year.

### 1. Comparative Morphology of the Cryptogams Messrs. CLEMENTS and BUTTERS and Miss MISZ

The course embraces morphology of the cryptogams. Especial attention is paid to the green Algae, the foundation of the vegetable kingdom. The other groups of Algae and the Fungi are briefly treated, particular stress being laid on their economic relations to other plants, to animals and to man. Examples of liver-worts, mosses, ferns, and their allies are studied in the laboratory, and the line of development which leads from the Algae through the archegoniate series to the seed plants is emphasized.

### 2. The Morphology, Anatomy, and Classification of the Higher Seed Plants Messrs. CLEMENTS and BUTTERS and Miss MISZ

Prerequisite, Botany 1.

In this course especial attention is paid to vegetable histology. The characteristic plant tissues are examined, and their arrangement is noted in roots, stems, leaves, fruit, and seeds. The formation and occurrence of carbohydrates, glucosides, alkaloids, organic acids, resins, gums, gum resins, and oleo-resins are carefully studied. Considerable time is devoted to the study of the basis of classification of flowering plants and to the identification of plants in the field.

## 3. Micro-Botany

Mr. BUTTERS and Miss MISZ

Designed to furnish practical training in the use of the microscope, in the preparation of material for microscopic examination, including the use of microchemical reagents, and in the representation by drawings of all structures observed.

The work of this course is co-incidental with that of 2 and 3.

## CHEMISTRY

GEORGE B. FRANKFORTER, M.A., Ph.D., Professor of Chemistry

CHARLES F. SIDENER, B.S., Professor of Quantitative Chemistry

EVERHART P. HARDING, M.S., Ph.D., Assistant Professor of Chemistry

IRA HARRIS DERBY, Ph.D., Assistant Professor of Chemistry

WILLIAM H. HUNTER, Ph.D., Instructor in Chemistry

## 1. General Chemistry

Messrs. DERBY and HUNTER

Five credits (forty-five hours lecture, ninety hours laboratory); first quarter, first year.

This course includes a study of the chemical properties of the metallic and non-metallic elements.

## 2. Qualitative Analysis

Messrs. DERBY and HUNTER

Five credits (forty-five hours lecture, ninety hours laboratory); second quarter, first year. Prerequisite, Chemistry 1.

This course covers the common reactions of the metals and acids and their qualitative separation. The ionic theory and the law of mass action are discussed with especial reference to qualitative reactions.

## 3. Quantitative Analysis

Mr. SIDENER and ASSISTANT

Three credits (twenty-seven hours lecture, fifty hours laboratory); third quarter, second year. Prerequisites, Chemistry 1 and 2.

A study of the principles of quantitative estimation; gravimetric, volumetric, and gasometric.

## 4. Toxicology, Water and Food Analysis (Postgraduate)

Messrs. FRANKFORTER, DERBY, and HARDING

Three and one-half credits (twenty-seven hours lecture, seventy-two hours laboratory); second quarter, second year.

The chemistry of the atmosphere, water, soil, etc.; the sanitary examination of air and water.

## 5. Organic Chemistry

Messrs. FRANKFORTER and DERBY

Nine and one-half credits (seventy-two hours lecture, one hundred ninety-eight hours laboratory); third and fourth quarters, first year.

This course includes work in both the aliphatic and aromatic series and the preparation of the more important compounds.

## CLINICAL MICROSCOPY

## 1. Clinical Microscopy (Postgraduate)

Drs. ROBERTSON and HYNES

Instruction includes (a) the macroscopical study of urine, its colors, sediments, and finer chemical tests; (b) the microscopical study of urinary sediments, including blood, pus, epithelial cells, casts, etc.

## DISPENSARY PRESCRIPTION PRACTICE

The dispensing department of the University Hospitals Out-Patient Department at 1808 Washington Avenue South, Minneapolis, has lately been placed in charge of the College of Pharmacy. The senior students are sectioned into classes of three for the purpose of doing practical prescription work at the dispensary under the direction of Dr. Bloomo. The dispensary practice continues throughout the college year.

## FIRST AIDS TO THE INJURED

## 1. Emergency Cases

Dr. McCLOUD

Two-thirds credit (twelve hours lecture); third quarter, second year.

A series of lectures designed to qualify the pharmacist to administer upon emergency cases before the arrival of the physician.

## MATERIA MEDICA AND THERAPEUTICS

EDGAR D. BROWN, Phm.D., M.D., Professor of Materia Medica and Therapeutics

CHARLES F. DIGHT, M.D., Lecturer in Materia Medica

..... Assistant in Materia Medica

## 1. Inorganic Materia Medica

Dr. BROWN and ASSISTANT

## 2. Organic Materia Medica

Dr. BROWN and ASSISTANT

Six credits (one hundred and eight hours lecture and recitation); third and fourth quarters, first year; first and second quarters, second year.

The work in inorganic and organic materia medica is based principally on the U. S. P., but unofficial and synthetic drugs are also studied. The course includes the study of the general characteristics of drugs and physiological action. Pharmacodynamics, including the study of the identity and quality of drugs, shares attention in the course in pharmacognosy.

## 3. Therapeutics

Drs. BROWN and DIGHT

One credit (eighteen hours lecture and recitation); third quarter, second year. Prerequisites, Materia Medica 1 and 2.

In this course drugs are studied in groups, as governed by their physiologic action, and the therapeutic features of such groups are described. Remedial measures other than those depending upon drugs are fully considered.

## PHARMACY

FREDERICK J. WULLING, Phm.D., LL.M., etc., Professor of Pharmacology

GUSTAV BACHMAN, Phm.D., Phm.M., Instructor in Pharmacy

OSCAR BLOMO, Ph.C., Instructor in Dispensing

## History of Pharmacy

Dr. WULLING

One-third credit (six hours lecture); first quarter, first year.

The history of the U. S. Pharmacopoeia through all its revisions. Dispensatories, text-books, and works of reference.

## 2. Metrology

Drs. WULLING, BACHMAN, and BLOSMO

Two-thirds credit (twelve hours lecture); first quarter, first year.

Weights and measures, including metric system; balances—construction, varieties, methods of weighing; specific gravity in detail; specific volume, alligation, etc.

## 3. The Physics of Pharmacy

Drs. WULLING, BACHMAN, and BLOSMO

Three credits (eighteen hours lecture, seventy-two hours laboratory); second quarter, first year. Prerequisite, Pharmacy 2.

Students are required to have had elementary physics before entering. This course covers a review and more extended elucidation of such divisions of physics as apply to pharmaceutical processes. Special attention is paid to heat. Specific heat; thermometers—the various scales, testing and comparing thermometers; combustion of solids, liquids, and gases in various kinds of furnaces, stoves, and burners; application of heat in drying ovens, steam, hot-air and water ovens; drying closets, desiccators, blow-pipes, crucibles; baths for controlling and equalizing heat; evaporation—spontaneous, rapid, slow, in vacuo; ebullition—boiling points, fusion; sublimation, calcination, dehydration, torrefaction, roasting, reduction, oxidation, carbonization, deflagration, ignition, etc.; solution—pharmaceutical, simple, chemical, saturated; circulatory displacement; dialysis—construction of dialyser, osmosis, endosmosis, exosmosis, crystalloids and colloids, etc.

## 4. Pharmaceutical Processes

Drs. WULLING, BACHMAN, and ASSISTANT

Three and one-half credits (twenty-four hours lecture, seventy-two hours laboratory); second quarter, first year. Prerequisite, Pharmacy 3.

The processes not taken up in Course 3 constitute the subjects of this course. In part they are: Drug grinding and powdering; comminution; contusion; trituration; sifting; elutriation; levigation; lixiviation; filtration—filtering medii, filtration of solutions, oils, syrups, rapid filtration, filtration in vacuo, hot filtration, colation; washing—displacement, continuous; decantation—the syphon and its uses; precipitation—methods, vessels, separating, drying, weighing; granulation—granular effervescent salts; desiccation; exciccation; crystallization—water of crystallization, deliquescence, methods of obtaining crystals, collecting, draining, washing, drying crystals, fractional crystallization; distillation—simple, fractional, destructive; extraction; maceration; expression; percolation—history, theories, percolators, exhaustion, repercolation, continuous percolation, fractional percolation; clarification; decolorization.

## 5. Pharmacopoeial Preparations

Drs. WULLING, BACHMAN, and ASSISTANT

Five credits (thirty hours lecture, one hundred twenty hours laboratory); third and fourth quarters, first year.

This course includes the study and preparation of official bodies for which the U. S. P. gives formulae and processes, and includes waters, solutions, syrups, mucilages, spirits, infusions, decoctions, tinctures, fluid extracts, vinegars, wines, liniments, oleates, ointments, cerates, resins, oleo-resins, honeys; glycerites, mixtures, emulsions, elixirs, collodions, pills, capsules, powders, suppositories, bougies, plasters, papers, cachets, etc.

## 6. Mathematics of Pharmacy

Drs. WULLING and BACHMAN

While students are required to have a preparation in Arithmetic and Algebra before entering, they receive frequent drills at stated hours and as occasion requires or suggests throughout the entire course. Students are required to take final examinations in the subject at the end of the first and second year, at which examination they must attain a rating of at least eighty per cent.



## 7. Pharmacy Quiz

Dr. BACHMAN

Three credits (fifty-four hours); second, third, and fourth quarters, first year. Prerequisites, Pharmacy 2, 3, 4, and 5.

A thorough review of the work covered in Courses 2, 3, 4, and 5.

## 8. Identification of Inorganic Official Preparations

Dr. BACHMAN

One credit (eighteen hours); second and third quarters, first year.

The study of the physical properties of official preparations.

## 9. Chemical Philosophy

Dr. WULLING

One and one-half credits (twenty-seven hours lecture); first quarter, first year.

Treats of the principles underlying chemistry, and endeavors to elucidate chemical facts and phenomena. The subject is divided into chemical statics, embracing the study of the theories of atoms and molecules, atomic weights, atomic and molecular volume, quantivalence, molecular structure, ions, electric qualities, etc., and chemical dynamics, the study of reactions and their equations, thermics, chemical properties in general, etc.

## 10. The Pharmaceutical Chemistry of the Non-Metals and their Preparations

Dr. WULLING

One and one-half credits (twenty-seven hours lecture); second quarter, first year. Prerequisite, Pharmacy 9.

## 11. Pharmacopoeial Inorganic Salts and Their Official Preparations

Dr. WULLING

Three credits (fifty-four hours lecture); third and fourth quarters, first year. Prerequisite, Pharmacy 10.

Especial reference to description, properties, and manufacture.

## 12. Classification of Pharmaceutical Organic Compounds

Dr. WULLING

One credit (eighteen hours lecture); first quarter, second year.

A preparation for Pharmacy 13.

## 13. Chemistry of the Pharmacopoeial Organic Compounds and their Preparations

Dr. WULLING

Three credits (fifty-four hours lecture); entire second year. Prerequisite, Pharmacy 12.

This course includes the critical study of cellulose and its derivatives, destructive distillation products, starches, sugars, fermentation products, organic acids, fixed oils and fats, volatile oils, waxes, and animal fats, alkaloids, glucosides, animal drugs and products, etc.

## 14. Pharmacopoeial Testing

Drs. WULLING, BACHMAN, and ASSISTANTS

Five credits (thirty-six hours lecture, one hundred eight hours laboratory); first and second quarters, second year.

A critical study of the identity, purity, limit, and percentage tests of the Pharmacopoeia and their application either wholly or in part to practically every official organic and inorganic salt and compound.

## 15. Quantitative Analysis of U. S. P. Salts and Preparations

Drs. WULLING and BACHMAN

Two credits (eighteen hours lecture, thirty-six hours laboratory); fourth quarter, second year. Prerequisites, Chemistry 3 and Pharmacy 14.

This course includes the gravimetric, volumetric, and gasometric determinations of the U. S. Pharmacopoeia, but not pharmaceutical assay work (20).

16. Incompatibility Drs. WULLING and BACHMAN  
One-half credit (nine hours lecture); first and second quarters, second year.

Therapeutic, pharmaceutical, and chemical incompatibility is taken up in lecture and recitation work preliminary to 17.

17. Dispensing Drs. WULLING and BACHMAN  
Five and one-half credits (twenty-seven hours lecture, one hundred forty-four hours laboratory); first and second quarters, second year.  
Prerequisite, Pharmacy 16.

The study of the prescription and practical work in dispensing upwards of one hundred typical prescriptions.

18. Manufacture of Official Organic and Inorganic Salts and Preparations Drs. WULLING, BACHMAN, and ASSISTANT  
Four and one-third credits (twenty-four hours lecture, one hundred eight hours laboratory); second quarter, second year.

The preparation of about forty official salts included in the course.

19. National Formulary Drs. WULLING and BACHMAN  
One credit (six hours lecture, twenty-four hours laboratory); third quarter, second year.

This course, lecture and laboratory, includes the study of the National Formulary and the making of one or more members of each class of preparations.

20. Pharmaceutical Assay Drs. WULLING, BACHMAN, and ASSISTANT  
One and one-third credits (six hours lecture, thirty-six hours laboratory); fourth quarter, second year. Prerequisites, Pharmacy 14 and Chemistry 3.

The quantitative determination of active constituents of a number of the potent organic drugs and preparations.

21. Synthetic Remedies Dr. WULLING  
One-third credit (six hours lecture); fourth quarter, second year.  
Prerequisite, Pharmacy 12 and 13 and Chemistry 4.

A study of the chemistry of synthetic remedies in medical use.

22. Homeopathic Pharmacy Drs. WULLING and BACHMAN  
Fourth quarter, second year.

A brief exposition of the principles underlying homeopathic medication, with some laboratory work.

23. Identification of Salts Dr. BACHMAN  
One and one-half credits (thirty-six hours laboratory); entire second year.

The study of the physical identity of the more important official inorganic and organic salts.

24. Micro-Chemistry Dr. WULLING  
Fourth quarter, second year. Optional.  
A brief course is provided for seniors if time permits.

## PHARMACEUTICAL JURISPRUDENCE

## 1. Law for Pharmacists

Dr. WULLING

Two-thirds credit (twelve hours lecture); fourth quarter, second year.

The lectures introduce the subjects of contracts, agency, commercial paper, and insurance, and discuss the liability of retail and manufacturing pharmacists, etc.

## PHARMACEUTICAL MINERALOGY AND CRYSTALLOGRAPHY

## 1. Mineralogy

Mr. GROUT

One credit (eighteen hours lecture); second quarter, second year.

A study of the occurrence and properties of minerals of pharmaceutical importance; ores of metals used in pharmacy; non-metallic minerals and mineral waters in their mineralogic and geologic relations.

## 2. Crystallography

Mr. GROUT

One credit (eighteen hours lecture); second quarter, second year.

Prerequisite, Mineralogy 1.

A survey of form and more evident physical characters as a basis for practice in sight recognition of economic minerals and their distinction from common rocks.

## PHARMACOGNOSY

The courses in Pharmacognosy are designed to give the student that specific training which will enable him to determine the identity and quality of both crude and powdered vegetable drugs. Some attention is given in these courses to the methods and results of pharmacophysiological research.

..... Professor of Pharmacognosy

EDWIN L. NEWCOMB, P.D., Instructor in Pharmacognosy

(At present in charge of the work)

MANLEY H. HAYNES, Phm.B., Assistant

## Courses 1 and 2

Dr. NEWCOMB and ASSISTANT

Together, two credits (eighteen hours lecture, thirty-six hours laboratory); second semester, first year.

## 1. Pharmacognosy of the Cryptogams

In this course many of the valuable drugs and economic products obtained from the cryptogams are studied.

## 2. Pharmaco-Histology

This course is designed to complete the preparation of the student for the senior work in Pharmacognosy. It includes micrometry and the detailed study of the inner structure of the parts of the higher plants as illustrated in about forty official and unofficial drugs.

## Courses 3, 4, and 5

Dr. NEWCOMB and ASSISTANT

Together, ten credits (one hundred eight hours lecture, two hundred sixteen hours laboratory, including field work); first and second semester, second year. Prerequisites, Pharmacognosy 1; Botany 1, 2, and 3.

## 3 and 4. Pharmacognosy of the Angiosperms

In this course the time is devoted to the scientific study both macroscopically and microscopically, of the official and of some of the unofficial vegetable drugs. The work naturally divides itself into the study of crude drugs (Course 3) and of powdered drugs (Course 4.)

For convenience and purposes of comparison drugs will be studied under Course 3 in the following order: Seeds, roots, and rhizomes; barks, woods, and pith; flowers; fruits; leaves and herbs; exudations and other plant products. Here or at some other consistent place animal drugs and plant and animal fibers will be studied.

In Course 4 the more important vegetable drugs occurring in powdered form are examined and studied microscopically. The adulterants of powdered drugs and their detection are given considerable attention.

## 5. Field Work

In the spring of the year and at other suitable times the classes are taken on field excursions to search for native medicinal plants. The study of the distinguishing characteristics of certain orders, families, and genera, to which the medicinal plants belong, is included in this work.

## PHYSIOLOGY

RICHARD OLDING BEARD, M.D., Professor of Physiology

M. RUSSELL WILCOX, M.D., Assistant Professor of Physiology

FREDERICK H. SCOTT, B.A., Ph.D., M.B., D.Sc., Assistant Professor of Physiology

## 1. Physiology, Anatomy, and Histology Drs. BEARD, WILCOX, and SCOTT

One credit (eighteen hours lecture and recitation); first quarter, second year.

The work covers the study of the physiological properties of the cell, the nutritive media, the nervous mechanisms in general, muscular tissues, connective tissues, and epithelial tissues. The subjects of anatomy and histology are touched upon sufficiently to lay the foundation for the proper understanding of physiological functions.

Special attention is directed to the action of drugs and their effects upon the various systems.

## 2. Qualitative and Quantitative Urinalysis (Postgraduate) Dr. BEARD

One credit (nine hours lecture, eighteen hours laboratory); second semester. Prerequisite, Physiology 1.

Lectures, recitations, and laboratory work. The laboratory work includes the qualitative analysis of representative specimens of urine as regards their physical properties, inorganic and organic constituents, as well as the quantitative determination of chlorides, urea, ammonia, total nitrogen, sugar and albumin, together with the preparation of reagents.

## 3. Experimental Physiology (Postgraduate) Drs. BEARD and WILCOX

Four credits (thirty-six hours lecture, seventy-two hours laboratory); second semester. Prerequisite, Physiology 2.

Laboratory work and demonstrations. A study of physiologic apparatus, electric stimuli, and methods of experimentation; the demonstration and performance of experiments which illustrate physiologic function in the muscular, nervous, vascular, respiratory,

and glandular systems; and the study of the cardiac areas, the heart and respiratory sounds, and of pulse tracings, including training in the use of the sphygmograph, the stethoscope, phonendoscope, etc.

#### 4. Physiological Chemistry and Microscopy (Postgraduate)

Drs. BEARD and WILCOX

Eight credits (seventy-two hours lecture, one hundred forty-four hours laboratory); first semester. Prerequisite, Physiology 3.

Laboratory work and demonstrations. A practical study of the several classes of proteids; of carbohydrates, fats, muscle, and bone; of gastric juice, saliva, pancreatic juice, and bile in their respective digestions; of glycogen, and of blood lymph, chyle, and milk. Microscopic study of the carbohydrates in vegetable and animal forms; of the physiologic emulsions of fat; of the crystalline waste products, and of the physiologic conditions of the blood cells and of blood crystals. Practical instruction is given during this course in the enumeration of blood cells, in the estimation of haemoglobin and of the corpuscles in mass, in the spectroscopic examination of the blood in the determination of blood tests and in the use of polariscope.

### MINNESOTA PHARMACY LAW

Several lectures elucidating the rights, duties, privileges, and liabilities of pharmacists under the State law regulating the practice of pharmacy, are given by special lecturers near the close of the second year.

### SPECIAL LECTURES

From twelve to fifteen special lectures on subjects related to the practice of pharmacy are delivered by well-known pharmacists and others at intervals during the college year.

### LECTURE AND LABORATORY SCHEDULES

Lecture and laboratory schedules will be posted on the college bulletin in September.

The college year is divided into four quarters, the first and second constituting the first semester, and the third and fourth, the second semester. The college year covers nine full months or thirty-eight weeks. Each quarter consists of nine working weeks. To the second and fourth quarters, one examination week is added.



# STUDENTS

## SENIORS—27

|                                      |                                      |
|--------------------------------------|--------------------------------------|
| Ash, Ben S., Delano                  | Hutchinson, Roy, Duluth              |
| Barber, Ralph C., Long Prairie       | Kusterman, Fred G., St. Cloud        |
| Barnett, Samuel, St. Paul            | Larson, George A., Atwater           |
| Beedy, Harry V., Minneapolis         | *Muehlbauer, Adolph A., St. Paul     |
| Cannon, Raymond W., Minneapolis      | Olson, Alfred W., Argyle             |
| Cutting, Chas. P., Sleepy Eye        | Perkins, Clarence A., Annandale      |
| Faas, Joseph P., Sleepy Eye          | Remington, Porter B., Minneapolis    |
| Finberg, Joseph, St. Paul            | Riley, Cusack M., Waukon, Ia.        |
| Goodwin, George E., Webster, S. D.   | Schaffer, Leo L., Delano             |
| Hanson, Hjalmar T., Eau Claire, Wis. | Scheer, Wesley A., Howard Lake       |
| Henney, Morris W., DeSmet, S. D.     | Schreiter, Norman C., Red Lake Falls |
| Holverson, Alice M., Alexandria      | Steinke, Benjamin F., Sleepy Eye     |
| Hughes, Stuart, Minneapolis          | Swenson, Orin L., Lamberton          |
| Witter, Henry R., Park Rapids        |                                      |

## JUNIORS—43

|                                       |                                    |
|---------------------------------------|------------------------------------|
| Ames, Harry, Minneapolis              | Hyde, Walter K., Savanna, Ill.     |
| Blaustein, Hynie, Minneapolis         | Johnson, Archie O., Hudson, Wis.   |
| Blomquist, Arthur T., Foreston        | Laue, Edwin R., New Ulm            |
| Breckenridge, Clinton S., Pine City   | Lawler, Lawrence, Minneapolis      |
| Brown, Alfred C., Minneapolis         | Mee, James J., Gaylord             |
| Capron, Ralph E., Minneapolis         | Micklesen, Walter H., Hudson, Wis. |
| Clark, A. Kelley, River Falls         | O'Brien, Frank P., Eden Valley     |
| Cohen, Ben M., Minneapolis            | Olien, Andrew T., Clarkfield       |
| Davidson, G. Milnor, Minneapolis      | Ostedt, Joseph H., St. Paul        |
| Dunham, Eugene, Faribault             | Pallmer, Holger E., Litchfield     |
| Emerson, Leslie, Elmore               | Pope, Samuel L., Thief River Falls |
| Epstein, Abe L., Minneapolis          | Price, Joseph, Le Roy              |
| Errickson, Alfred, Cashton            | Remer, Edwin A., Little Falls      |
| Ertel, Liguori M., Maple Lake         | Rempel, Peter J., Butterfield      |
| Graham, Thomas E., Park Rapids        | Scott, Roy T., Minneapolis         |
| Grain, Albert, Gibbon                 | Stevenson, Robert L., Albert Lea   |
| Hast, Theo. J., Andrew, Ia.           | Strimling, Joseph, Minneapolis     |
| Herchmer, J. Lyndale, Kamloops, B. C. | Swanson, Carl A., St. Paul         |
| Hilyard, James K., St. Paul           | Vikre, Sigfred M., Milan           |
| Holm, Noel, Minneapolis               | Wallraff, Winfred E. A., St. Paul  |
| Hoppe, Alfred G., Minneapolis         | Watson, Hugh M., St. Charles       |
| Young, Clift H., Fergus Falls         |                                    |

## UNCLASSED—7

|                                    |                                |
|------------------------------------|--------------------------------|
| Abramovitz, Samuel H., Minneapolis | Loe, Fred, Minneapolis         |
| Irish, Horace D., Des Moines, Ia.  | Rosenthal, Joseph, Minneapolis |
| Levin, Sadie Z., Minneapolis       | Shine, John D., Minneapolis    |
| Shoemaker, Ralph H., North Redwood |                                |

\*Deceased.













C  
McGraw-Hill  
1913-14

FOR LIBRARY  
OF THE  
UNIVERSITY OF ILLINOIS

# The University of Minnesota

## THE COLLEGE OF PHARMACY

1913-1914



BULLETIN OF THE UNIVERSITY OF MINNESOTA

VOL. XVI, NO. 5. MAY 1913

Entered at the Post Office  
in Minneapolis as second-class matter  
MINNEAPOLIS, MINN.



The Bulletin of the University of Minnesota is issued by the University of Minnesota as often as twice a month during the university year.

---

The Bulletin comprises—

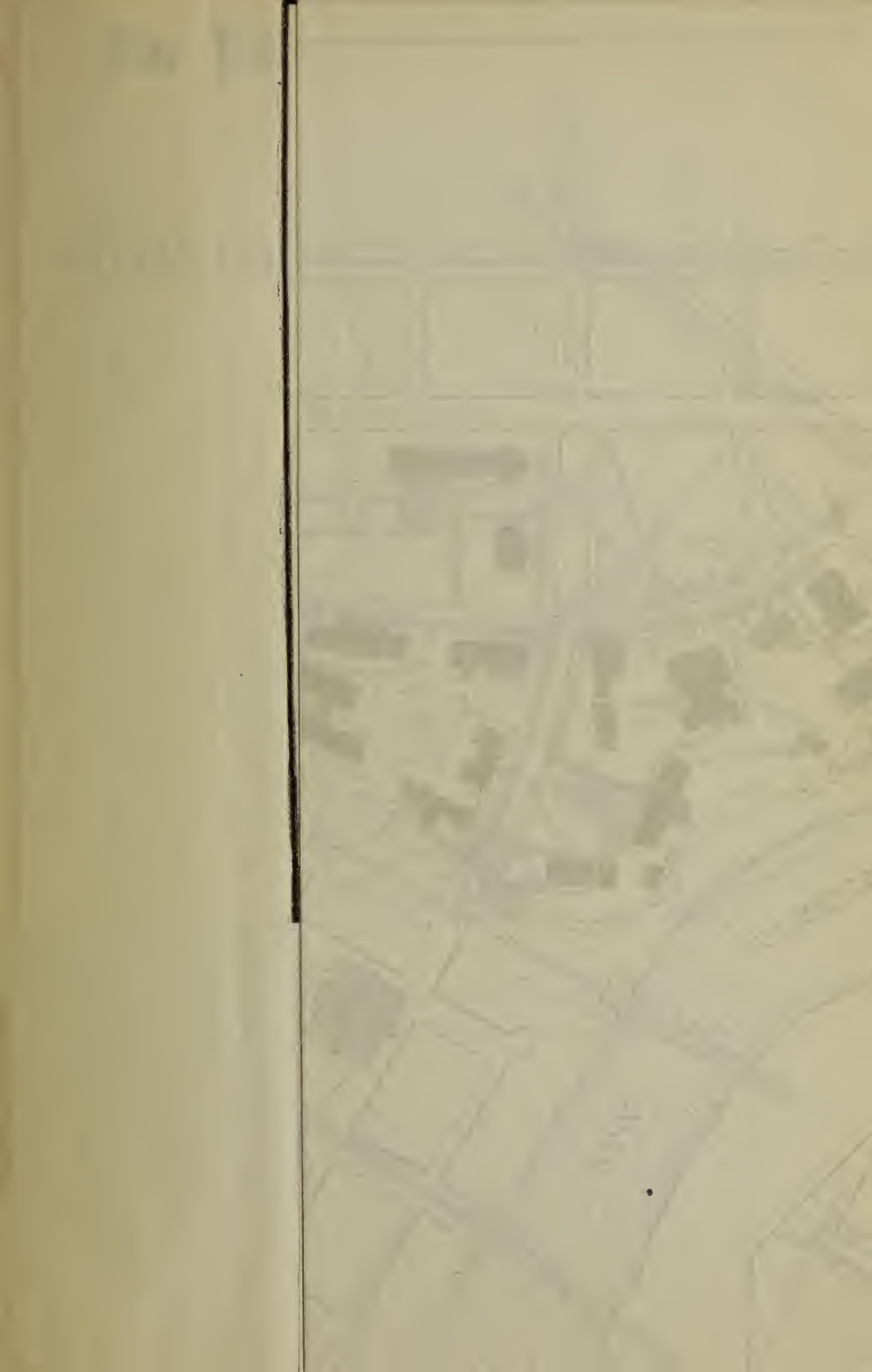
*Original Series.* The President's Report, the Bulletin of General Information, the annual announcements of the schools, colleges, and departments of the University of Minnesota, and other formal publications of the University.

*Extra Series.* Announcements of departments of instruction, reports of University officers, etc.

Bulletins will be sent gratuitously, postage paid, to all persons who apply for them. In calling for bulletins, the applicant should state whether the Bulletin of General Information is desired or the bulletin of a certain college or school of the University. Address

The REGISTRAR,

The University of Minnesota,  
Minneapolis, Minnesota.









# The University of Minnesota

## THE COLLEGE OF PHARMACY

1913-1914



BULLETIN OF THE UNIVERSITY OF MINNESOTA

VOL. XVI, NO. 5. MAY 1913

Entered at the Post Office  
in Minneapolis as second-class matter  
MINNEAPOLIS, MINN.

| 1913      |    |    |    |    |    |    | 1914     |    |    |    |    |    |    |
|-----------|----|----|----|----|----|----|----------|----|----|----|----|----|----|
| JULY      |    |    |    |    |    |    | JANUARY  |    |    |    |    |    |    |
| Su        | Mo | Tu | W  | Th | Fr | Sa | Su       | Mo | Tu | W  | Th | Fr | Sa |
| ..        | .. | 1  | 2  | 3  | 4  | 5  | ..       | .. | .. | .. | 1  | 2  | 3  |
| 6         | 7  | 8  | 9  | 10 | 11 | 12 | 4        | 5  | 6  | 7  | 8  | 9  | 10 |
| 13        | 14 | 15 | 16 | 17 | 18 | 19 | 11       | 12 | 13 | 14 | 15 | 16 | 17 |
| 20        | 21 | 22 | 23 | 24 | 25 | 26 | 18       | 19 | 20 | 21 | 22 | 23 | 24 |
| 27        | 28 | 29 | 30 | 31 | .. | .. | 25       | 26 | 27 | 28 | 29 | 30 | 31 |
| ..        | .. | .. | .. | .. | .. | .. | ..       | .. | .. | .. | .. | .. | .. |
| AUGUST    |    |    |    |    |    |    | FEBRUARY |    |    |    |    |    |    |
| ..        | .. | .. | .. | .. | 1  | 2  | 1        | 2  | 3  | 4  | 5  | 6  | 7  |
| 3         | 4  | 5  | 6  | 7  | 8  | 9  | 8        | 9  | 10 | 11 | 12 | 13 | 14 |
| 10        | 11 | 12 | 13 | 14 | 15 | 16 | 15       | 16 | 17 | 18 | 19 | 20 | 21 |
| 17        | 18 | 19 | 20 | 21 | 22 | 23 | 22       | 23 | 24 | 25 | 26 | 27 | 28 |
| 24        | 25 | 26 | 27 | 28 | 29 | 30 | ..       | .. | .. | .. | .. | .. | .. |
| 31        | .. | .. | .. | .. | .. | .. | ..       | .. | .. | .. | .. | .. | .. |
| SEPTEMBER |    |    |    |    |    |    | MARCH    |    |    |    |    |    |    |
| ..        | 1  | 2  | 3  | 4  | 5  | 6  | 1        | 2  | 3  | 4  | 5  | 6  | 7  |
| 7         | 8  | 9  | 10 | 11 | 12 | 13 | 8        | 9  | 10 | 11 | 12 | 13 | 14 |
| 14        | 15 | 16 | 17 | 18 | 19 | 20 | 15       | 16 | 17 | 18 | 19 | 20 | 21 |
| 21        | 22 | 23 | 24 | 25 | 26 | 27 | 22       | 23 | 24 | 25 | 26 | 27 | 28 |
| 28        | 29 | 30 | .. | .. | .. | .. | 29       | 30 | 31 | .. | .. | .. | .. |
| ..        | .. | .. | .. | .. | .. | .. | ..       | .. | .. | .. | .. | .. | .. |
| OCTOBER   |    |    |    |    |    |    | APRIL    |    |    |    |    |    |    |
| ..        | .. | .. | 1  | 2  | 3  | 4  | ..       | .. | .. | 1  | 2  | 3  | 4  |
| 5         | 6  | 7  | 8  | 9  | 10 | 11 | 5        | 6  | 7  | 8  | 9  | 10 | 11 |
| 12        | 13 | 14 | 15 | 16 | 17 | 18 | 12       | 13 | 14 | 15 | 16 | 17 | 18 |
| 19        | 20 | 21 | 22 | 23 | 24 | 25 | 19       | 20 | 21 | 22 | 23 | 24 | 25 |
| 26        | 27 | 28 | 29 | 30 | 31 | .. | 26       | 27 | 28 | 29 | 30 | .. | .. |
| ..        | .. | .. | .. | .. | .. | .. | ..       | .. | .. | .. | .. | .. | .. |
| NOVEMBER  |    |    |    |    |    |    | MAY      |    |    |    |    |    |    |
| ..        | 2  | 3  | 4  | 5  | 6  | 7  | ..       | .. | .. | .. | 1  | 2  | 3  |
| 9         | 10 | 11 | 12 | 13 | 14 | 15 | 3        | 4  | 5  | 6  | 7  | 8  | 9  |
| 16        | 17 | 18 | 19 | 20 | 21 | 22 | 10       | 11 | 12 | 13 | 14 | 15 | 16 |
| 23        | 24 | 25 | 26 | 27 | 28 | 29 | 17       | 18 | 19 | 20 | 21 | 22 | 23 |
| 30        | .. | .. | .. | .. | .. | .. | 24       | 25 | 26 | 27 | 28 | 29 | 30 |
| ..        | .. | .. | .. | .. | .. | .. | 31       | .. | .. | .. | .. | .. | .. |
| DECEMBER  |    |    |    |    |    |    | JUNE     |    |    |    |    |    |    |
| ..        | 1  | 2  | 3  | 4  | 5  | 6  | ..       | 1  | 2  | 3  | 4  | 5  | 6  |
| 7         | 8  | 9  | 10 | 11 | 12 | 13 | 7        | 8  | 9  | 10 | 11 | 12 | 13 |
| 14        | 15 | 16 | 17 | 18 | 19 | 20 | 14       | 15 | 16 | 17 | 18 | 19 | 20 |
| 21        | 22 | 23 | 24 | 25 | 26 | 27 | 21       | 22 | 23 | 24 | 25 | 26 | 27 |
| 28        | 29 | 30 | 31 | .. | .. | .. | 28       | 29 | 30 | .. | .. | .. | .. |
| JULY      |    |    |    |    |    |    | JANUARY  |    |    |    |    |    |    |
| Su        | Mo | Tu | W  | Th | Fr | Sa | Su       | Mo | Tu | W  | Th | Fr | Sa |
| ..        | .. | .. | 1  | 2  | 3  | 4  | ..       | .. | .. | .. | 1  | 2  | 3  |
| 5         | 6  | 7  | 8  | 9  | 10 | 11 | 4        | 5  | 6  | 7  | 8  | 9  | 10 |
| 12        | 13 | 14 | 15 | 16 | 17 | 18 | 11       | 12 | 13 | 14 | 15 | 16 | 17 |
| 19        | 20 | 21 | 22 | 23 | 24 | 25 | 18       | 19 | 20 | 21 | 22 | 23 | 24 |
| 26        | 27 | 28 | 29 | 30 | 31 | .. | 25       | 26 | 27 | 28 | 29 | 30 | 31 |
| ..        | .. | .. | .. | .. | .. | .. | ..       | .. | .. | .. | .. | .. | .. |
| AUGUST    |    |    |    |    |    |    | FEBRUARY |    |    |    |    |    |    |
| ..        | .. | .. | .. | .. | .. | 1  | 1        | 2  | 3  | 4  | 5  | 6  | 7  |
| 2         | 3  | 4  | 5  | 6  | 7  | 8  | 8        | 9  | 10 | 11 | 12 | 13 | 14 |
| 9         | 10 | 11 | 12 | 13 | 14 | 15 | 15       | 16 | 17 | 18 | 19 | 20 | 21 |
| 16        | 17 | 18 | 19 | 20 | 21 | 22 | 22       | 23 | 24 | 25 | 26 | 27 | 28 |
| 23        | 24 | 25 | 26 | 27 | 28 | 29 | ..       | .. | .. | .. | .. | .. | .. |
| 30        | 31 | .. | .. | .. | .. | .. | ..       | .. | .. | .. | .. | .. | .. |
| SEPTEMBER |    |    |    |    |    |    | MARCH    |    |    |    |    |    |    |
| ..        | .. | 1  | 2  | 3  | 4  | 5  | 1        | 2  | 3  | 4  | 5  | 6  | 7  |
| 6         | 7  | 8  | 9  | 10 | 11 | 12 | 8        | 9  | 10 | 11 | 12 | 13 | 14 |
| 13        | 14 | 15 | 16 | 17 | 18 | 19 | 15       | 16 | 17 | 18 | 19 | 20 | 21 |
| 20        | 21 | 22 | 23 | 24 | 25 | 26 | 22       | 23 | 24 | 25 | 26 | 27 | 28 |
| 27        | 28 | 29 | 30 | .. | .. | .. | 29       | 30 | 31 | .. | .. | .. | .. |
| ..        | .. | .. | .. | .. | .. | .. | ..       | .. | .. | .. | .. | .. | .. |
| OCTOBER   |    |    |    |    |    |    | APRIL    |    |    |    |    |    |    |
| ..        | .. | .. | .. | 1  | 2  | 3  | ..       | .. | .. | 1  | 2  | 3  | 4  |
| 4         | 5  | 6  | 7  | 8  | 9  | 10 | 5        | 6  | 7  | 8  | 9  | 10 | 11 |
| 11        | 12 | 13 | 14 | 15 | 16 | 17 | 12       | 13 | 14 | 15 | 16 | 17 | 18 |
| 18        | 19 | 20 | 21 | 22 | 23 | 24 | 19       | 20 | 21 | 22 | 23 | 24 | 25 |
| 25        | 26 | 27 | 28 | 29 | 30 | 31 | 26       | 27 | 28 | 29 | 30 | .. | .. |
| ..        | .. | .. | .. | .. | .. | .. | ..       | .. | .. | .. | .. | .. | .. |
| NOVEMBER  |    |    |    |    |    |    | MAY      |    |    |    |    |    |    |
| 1         | 2  | 3  | 4  | 5  | 6  | 7  | ..       | .. | .. | .. | 1  | 2  | 3  |
| 8         | 9  | 10 | 11 | 12 | 13 | 14 | 3        | 4  | 5  | 6  | 7  | 8  | 9  |
| 15        | 16 | 17 | 18 | 19 | 20 | 21 | 10       | 11 | 12 | 13 | 14 | 15 | 16 |
| 22        | 23 | 24 | 25 | 26 | 27 | 28 | 17       | 18 | 19 | 20 | 21 | 22 | 23 |
| 29        | 30 | .. | .. | .. | .. | .. | 24       | 25 | 26 | 27 | 28 | 29 | 30 |
| ..        | .. | .. | .. | .. | .. | .. | 31       | .. | .. | .. | .. | .. | .. |
| DECEMBER  |    |    |    |    |    |    | JUNE     |    |    |    |    |    |    |
| ..        | .. | 1  | 2  | 3  | 4  | 5  | ..       | 1  | 2  | 3  | 4  | 5  | 6  |
| 6         | 7  | 8  | 9  | 10 | 11 | 12 | 7        | 8  | 9  | 10 | 11 | 12 | 13 |
| 13        | 14 | 15 | 16 | 17 | 18 | 19 | 14       | 15 | 16 | 17 | 18 | 19 | 20 |
| 20        | 21 | 22 | 23 | 24 | 25 | 26 | 21       | 22 | 23 | 24 | 25 | 26 | 27 |
| 27        | 28 | 29 | 30 | 31 | .. | .. | 28       | 29 | 30 | .. | .. | .. | .. |

# UNIVERSITY CALENDAR

1913-1914

The University year covers a period of thirty-eight weeks, beginning on the second Tuesday in September. Commencement Day is always the second Thursday in June.

## 1913

|           |       |           |                                                                                                                  |
|-----------|-------|-----------|------------------------------------------------------------------------------------------------------------------|
| September | 2     | Tuesday   | Registration closes except for new students                                                                      |
| September | 2- 9  | Week      | Fees payable except for new students                                                                             |
| September | 8-15  | Week      | Examinations for removal of conditions, entrance examinations, registration of new students, and payment of fees |
| September | 10-16 | Week      | Military encampment of cadets                                                                                    |
| September | 17    | Wednesday | First semester begins                                                                                            |
| November  | 26    | Wednesday | Thanksgiving recess begins 9:00 p.m.                                                                             |
| December  | 1     | Monday    | Thanksgiving recess ends 8:00 a.m.                                                                               |
| December  | 19    | Friday    | Christmas vacation begins 9:00 p.m.                                                                              |

## 1914

|          |    |           |                                            |
|----------|----|-----------|--------------------------------------------|
| January  | 6  | Tuesday   | Christmas vacation ends 8:00 a.m.          |
| January  | 20 | Tuesday   | Registration for second semester closes    |
| January  | 26 | Monday    | Final examinations begin                   |
| January  | 27 | Tuesday   | Payment of fees for second semester closes |
| February | 4  | Wednesday | Second semester begins                     |
| February | 12 | Thursday  | Lincoln's Birthday: a holiday              |
| February | 13 | Friday    | First semester class reports due           |
| April    | 8  | Wednesday | Easter recess begins 9:00 p.m.             |
| April    | 16 | Thursday  | Easter recess ends 8:00 a.m.               |
| May      | 30 | Saturday  | Decoration Day: a holiday                  |
| June     | 1  | Monday    | Final examinations begin                   |
| June     | 6  | Saturday  | Second semester closes                     |
| June     | 7  | Sunday    | Baccalaureate service                      |
| June     | 8  | Monday    | Senior class day exercises                 |
| June     | 10 | Wednesday | Alumni Day                                 |
| June     | 11 | Thursday  | Forty-second Annual Commencement           |
| June     | 12 | Friday    | Summer vacation begins                     |

The University year for 1914-15 will begin Tuesday, September 8.

*Program of Entrance Examinations 1913-14*

Entrance examinations for admission to the various colleges of the University will be conducted according to the following schedule, in Room 112, Library Building, unless otherwise specified.

Any student finding a conflict in his program should report to the Registrar for adjustment.

|                     |         |        |                                                                                                                                                        |
|---------------------|---------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Monday,             | Sept. 8 | 9 a.m. | Business Subjects                                                                                                                                      |
|                     |         | 2 p.m. | Manual Subjects, Domestic Art and Science, Agriculture                                                                                                 |
| Tuesday,            | Sept. 9 | 9 a.m. | Astronomy, Botany, Geology, Chemistry, Physiography, Zoology, Physics, Physiology                                                                      |
|                     |         | 2 p.m. | American Government, History, Economics, Commercial Geography, History of Commerce, Economic History of England, Economic History of the United States |
| Wednesday, Sept. 10 |         | 9 a.m. | English                                                                                                                                                |
|                     |         | 2 p.m. | German, Greek, French, Latin, Scandinavian, Spanish                                                                                                    |
| Thursday, Sept. 11  |         | 9 a.m. | Elementary Algebra                                                                                                                                     |
|                     |         | 2 p.m. | Higher Algebra                                                                                                                                         |
| Friday, Sept. 12    |         | 9 a.m. | Plane Geometry                                                                                                                                         |
|                     |         | 2 p.m. | Solid Geometry                                                                                                                                         |

A representative of each department will be at the office of the head of the department each forenoon of entrance examination week from 9 to 12 to give information and advice.

## THE UNIVERSITY

THE COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

THE COLLEGE OF ENGINEERING AND THE MECHANIC ARTS

THE DEPARTMENT OF AGRICULTURE, including—

THE COLLEGE OF AGRICULTURE

THE COLLEGE OF FORESTRY, including—

FOREST EXPERIMENT STATIONS AT ITASCA AND CLOQUET

THE CENTRAL SCHOOL OF AGRICULTURE, UNIVERSITY FARM,  
including—

THE DAIRY SCHOOL

THE SHORT COURSE FOR FARMERS

TEACHERS' SUMMER TRAINING SCHOOL

THE SCHOOL OF TRACTION ENGINEERING

THE NORTHWEST SCHOOL OF AGRICULTURE, CROOKSTON

THE WEST CENTRAL SCHOOL OF AGRICULTURE, MORRIS

THE EXPERIMENT STATIONS, including—

THE MAIN STATION, ST. ANTHONY PARK

THE NORTHWEST EXPERIMENT STATION, CROOKSTON

THE NORTH CENTRAL EXPERIMENT STATION, GRAND RAPIDS

THE WEST CENTRAL EXPERIMENT STATION, MORRIS

THE NORTHEAST DEMONSTRATION FARM AND EXPERI-  
MENT STATION, DULUTH

THE SOUTHEAST DEMONSTRATION FARM AND EXPERI-  
MENT STATION, WASECA

THE FRUIT BREEDING FARM, ZUMBRA HEIGHTS

AGRICULTURAL EXTENSION

THE LAW SCHOOL

THE MEDICAL SCHOOL, including—

THE SCHOOL FOR NURSES

THE COLLEGE OF DENTISTRY

THE COLLEGE OF PHARMACY

THE SCHOOL OF MINES, including—

MINNESOTA SCHOOL OF MINES EXPERIMENT STATION

THE SCHOOL OF ANALYTICAL AND APPLIED CHEMISTRY

THE COLLEGE OF EDUCATION

THE GRADUATE SCHOOL



## THE BOARD OF REGENTS

|                                                         |   |   |                   |
|---------------------------------------------------------|---|---|-------------------|
| The Hon. JOHN LIND, Minneapolis, President of the Board | - | - | 1914              |
| GEORGE EDGAR VINCENT, Minneapolis                       | - | - | -                 |
| The President of the University                         | - | - | <i>Ex-Officio</i> |
| The Hon. ADOLPH O. EBERHART, Mankato                    | - | - | -                 |
| The Governor of the State                               | - | - | <i>Ex-Officio</i> |
| The Hon. C. G. SCHULZ, St. Paul                         | - | - | -                 |
| The State Superintendent of Public Instruction          | - | - | <i>Ex-Officio</i> |
| The Hon. JOHN G. WILLIAMS, Duluth                       | - | - | -                 |
| The Hon. A. E. RICE, Willmar                            | - | - | -                 |
| The Hon. CHARLES L. SOMMERS, St. Paul                   | - | - | -                 |
| The Hon. B. F. NELSON, Minneapolis                      | - | - | -                 |
| The Hon. PIERCE BUTLER, St. Paul                        | - | - | -                 |
| The Hon. FRED B. SNYDER, Minneapolis                    | - | - | -                 |
| The Hon. W. J. MAYO, Rochester                          | - | - | -                 |
| The Hon. MILTON M. WILLIAMS, Little Falls               | - | - | -                 |

---

## EXECUTIVE OFFICERS

GEORGE EDGAR VINCENT, Ph.D., LL.D., President  
 ERNEST B. PIERCE, B.A., Registrar  
 GEORGE H. HAYES, University Comptroller and Secretary of the Board of Regents  
 JAMES T. GEROULD, B.A., Librarian  
 JOHN F. DOWNEY, M.A., C.E., Dean of the College of Science, Literature, and the Arts  
 FRANCIS C. SHENEHON, C.E., Dean of the College of Engineering and the Mechanic Arts  
 ALBERT F. WOODS, M.A., Dean and Director of the Department of Agriculture  
 EDWARD M. FREEMAN, Ph.D., Assistant Dean of the Department of Agriculture.  
 WILLIAM R. VANCE, Ph.D., LL.B., Dean of the Law School  
 FRANK FAIRCHILD WESBROOK, M.A., M.D., C.M., Dean of the Medical School  
 ALFRED OWRE, B.A., M.D., C.M., D.M.D., Dean of the College of Dentistry  
 FREDERICK J. WULLING, Ph.D., LL.M., Dean of the College of Pharmacy  
 WILLIAM R. APPLEBY, M.A., Dean of the School of Mines  
 GEORGE B. FRANKFORTER, M.A., Ph.D., Dean of the School of Chemistry  
 GEORGE F. JAMES, Ph.D., Dean of the College of Education  
 GUY STANTON FORD, Ph.D., Dean of the Graduate School  
 MARGARET SWEENEY, Ph.D., Dean of Women

# THE COLLEGE OF PHARMACY

## FACULTY

- GEORGE EDGAR VINCENT, Ph.D., LL.D., President 1005 5th St. S. E.  
 CYRUS NORTHROP, LL.D., President, Emeritus 519 10th Ave. S. E.  
 FREDERICK J. WULLING, Ph.G., Phm.D., LL.M., Dean, Professor of Pharmacology, and Director of the University Medicinal Plant Gardens  
 3305 2d Ave. S.  
 RICHARD OLDING BEARD, M.D., Professor of Physiology  
 The Virginia, Lowry Hill  
 CHARLES F. SIDENER, B.S., Associate Professor of Quantitative Chemistry  
 1320 5th St. S. E.  
 GEORGE B. FRANKFORTER, M.A., Ph.D., Professor of Chemistry  
 525 E. River Road  
 FRANK F. WESBROOK, M.A., M.D., C.M., Professor of Bacteriology  
 906 5th St. S. E.  
 IRA HARRIS DERBY, Ph.D., Assistant Professor of Chemistry  
 2157 Commonwealth Ave., St. Paul  
 FREDERIC E. CLEMENTS, Ph.D., Professor of Botany 800 4th St. S. E.  
 EDGAR D. BROWN, Phm.D., M.D., Associate Professor of Pharmacology  
 3525 3d Ave. S.  
 ..... Professor of Pharmacognosy  
 FREDERIC K. BUTTERS, B.S., B.A., Assistant Professor of Botany  
 815 7th St. S.  
 FRÉDERICK H. SCOTT, Ph.D., M.B., D.Sc., Associate Professor of Physiology  
 1307 6th St. S. E.  
 FRANK F. GROUT, M.S., Assistant Professor of Geology and Mineralogy  
 2150 Carter Ave., St. Paul  
 GUSTAV BACHMAN, Phm.D., Phm.M., Assistant Professor of Pharmacy  
 2624 Fremont Ave. S.  
 EDWIN L. NEWCOMB, P.D., Assistant Professor of Pharmaceutical Botany  
 and Pharmacognosy 719 6th Ave. S. E.  
 OSCAR J. BLOSMO, Ph.C., Instructor in Dispensing 529 Oak St. S. E.  
 CHARLES F. DIGHT, M.D., Lecturer in Materia Medica  
 4818 39th Ave. S.  
 JOHN A. HANDY, Ph.C., B.S., Instructor in Pharmaceutical Chemistry  
 613 University Ave. S. E.  
 ..... Assistant in Pharmacognosy  
 WILLIAM H. HUNTER, Ph.D., Instructor in General and Qualitative  
 Chemistry 112 Church St. S. E.

JOHN ELDON HYNES, Ph.C., M.D., Assistant in Clinical Microscopy  
 3349 University Ave. S. E.  
 C. NAUMANN McCLOUD, Phm.D., M.D., Lecturer on First Aids to the  
 Injured 524 Lowry Bldg., St. Paul  
 CHAUNCEY J. V. PETTIBONE, B.S., Instructor in Physiology  
 112 Church St. S. E.  
 HAROLD E. ROBERTSON, B.A., M.D., Instructor in Clinical Microscopy  
 508 Essex St. S. E.  
 WALTER D. SHELDEN, B.S., M.D., Instructor in Therapeutics  
 820 Donaldson Bldg.  
 ..... Instructor in Pharmaceutical Latin  
 ..... Assistant in Materia Medica

## SPECIAL LECTURERS

|                  |                |                  |
|------------------|----------------|------------------|
| W. A. FROST      | W. G. NOYES    | E. A. TUPPER     |
| STEWART GAMBLE   | A. J. KLINE    | THOMAS VOEGELI   |
| J. W. HARRAH     | C. B. McCALL   | JUSTIN S. BREWER |
| CHARLES H. HUHNS | A. D. THOMPSON |                  |

## GENERAL INFORMATION

### ADMISSION

#### *A. To the Two-Year Course*

While nearly all the students enrolled in this College are graduates of full four-year high-school courses, such a training prior to entrance is not obligatory at the present time. The requirements, however, are being raised gradually in such a way that soon they shall be a full high-school preparation or its equivalent for all matriculants.

- I. Applicants may be admitted without examination if they bring certificates of graduation from, or standing in, institutions of collegiate grade or present other credentials showing that they have successfully completed the branches of study embraced in a full four-year high-school course, or an equivalent, provided that among the branches completed are:

English, two years, including the principles of composition and practice in written expression.

Algebra, one year, elementary, up to beginning of Higher Algebra.

Geometry, one year, elementary.

Physics, one year, elementary.

Latin, two years; grammar, one year; Caesar (four books), one year. Two years of a modern language may be substituted for the second year of Latin.

- II. Other applicants must pass examinations in the branches above specified, i. e., in English, Algebra, Geometry, Physics, and Latin or present satisfactory evidence of having completed these branches for which substitutes can not be accepted.

Students will be allowed to carry not more than two conditions, which, however, must be removed before the final examinations in the first-year subjects.

In certain cases credit is given for drug-store experience.

#### *B. To the Three-Year Course*

The minimum requirements for admission to the three-year course are the same as those for admission to the two-year course II, with the exception that students may carry as conditions not more than three of the entrance subjects, one of which can not be English. Students must pursue the branches in which they are conditioned during their first year and pass examinations in them or present evidence of having satisfactorily completed the branches. The subjects are not taught at the College but may be taken at the academy near by, or at the city high schools or with private tutors. The University Y. M. C. A. usually establishes courses for the benefit of students conditioned in entrance branches.

Applicants whose preparatory course of study has not conformed precisely to the requirements above enumerated will be allowed to offer, in lieu of a portion of these requirements, equivalent preparation in similar branches of study; and, if they show by examination or by other evidence, that their preparation has been substantially equivalent, such branches will be accepted as substitutes for those omitted.

The examinations for entrance are conducted by the Faculty of the College of Pharmacy, beginning at 9:00 a.m., on Tuesday, September 16, 1913. Lecture work begins as soon as possible after the examinations, usually the following day.

Every applicant is required to furnish a certificate of good moral character.

Those who do not pass the entrance examinations in not more than three of the required subjects, may enter and complete their course in three years, provided they pursue the subjects required for admission in addition to the professional work that may be assigned to them, and pass their entrance examinations before the end of the first year.

### REGISTRATION

Registration begins September 9. All applicants for admission to the regular courses must present to the Dean not later than September 16, their school or high-school certificates, diplomas, or such other credentials as they may wish to offer toward meeting in whole or in part the entrance requirements. If these are found satisfactory, the applicant will fill out the necessary registration blanks and present them in the office of the University Registrar, who will issue to him a statement of fees, including tuition fee and general deposit fee. The applicant will pay the fees indicated to the Cashier and receive receipts therefor. Registration is completed by depositing these receipts in the office of the Dean. The student is then classified.

### ADVANCED STANDING

Applicants for advanced standing must pass the entrance examinations or present the usual equivalents. They must furnish satisfactory evidence of time spent and subjects covered in previous professional studies, and must pass the examinations of all departments in which they wish to be exempt, if such examinations are deemed necessary by the professors in charge. Students will not be permitted to substitute private work in any branch for the regular course work.

### UNCLASSSED STUDENTS

Unclassed or special students may enter at any time provided there is laboratory room for them. They will not be rated on their work nor examined unless they make special request therefor. Work completed will be credited should the student subsequently enter the regular course.



## EXAMINATIONS AND STANDINGS

Examinations are held at the end of the regular school year and during the last week of the first semester and are supplementary to the written tests and quizzes that are held at frequent intervals during the year, and with them form largely the basis of final determination of fitness for promotion or graduation. Students are rated throughout the year, and all who have a standing of ninety per cent, or more, in certain of the branches, may not be required to take the final examination in those branches.

Students are not required to write graduating theses, but instead they keep complete records of their laboratory work. The records are to be kept in substantially bound books, to be approved by the Faculty. The respective professors call for the records for inspection and rating once a month or oftener. Duplicates of records are to be furnished the College by the students. The College provides the paper.

The standing of students is determined by the results of recitations, written examinations, laboratory work, and attendance. It is indicated by the terms *excellent*, *passed*, *conditioned*, *incomplete*, or *failed*. Conditions may be removed as indicated below. Incomplete work must be made up before the final examinations of the following year.

In order to become eligible for final examinations, students are required to attend at least four-fifths of the lectures in each course. This rule is not intended for the benefit of those who seek admission after the opening of the college year, but is designed to cover cases of sickness or unavoidable absence. It does not apply to laboratory courses which must be taken in full and must be entered during the first week in which they begin.

Students having conditions in more than two major or in more than three minor subjects of the first year can not enter upon the second year's work. All entrance conditions must be removed before the next spring examination. Candidates for graduation must have removed all conditions before entering upon the second semester of the graduating year.

Condition examinations are held during the first week of the course in September. The dates are usually posted in June. Conditioned students are required to inform themselves as to these dates as soon as they learn that they are conditioned, as no other notice is given. A fee of one dollar is charged for a second condition examination. Failure at the second condition examination obliges the student to repeat the work of the respective course. Students who carry a condition into a succeeding year may find a conflict of lecture or laboratory hours. In such cases they are to give preference to the lower course.

Absence will not be excused unless satisfactory reasons are given to the professor in charge. Habitual absence without a satisfactory excuse, continued indifference to study, or persistently poor scholarship may subject the student to temporary or permanent suspension. Students are earnestly requested to be present at the beginning of the school year, but those who can not enter in the fall may enter at the beginning

of the second semester, taking any of the subjects beginning then. Any of the facilities for work in the University are open to the students of this College, subject to the approval of the Dean. Opportunity is afforded to do advanced work in all branches. Text-books may be obtained after coming to the University.

The work of the College, as outlined in the following pages, is conducted by means of lectures, recitations and laboratory exercises. Students find their time fully occupied. Those who feel unable to complete the work in two years may divide it in a manner to complete it in three years. Practicing pharmacists who desire to take certain branches of study may avail themselves of any of the college facilities.

## GRADUATION REQUIREMENTS

Regular attendance at lectures, recitations and laboratory exercises is required. Students will not be permitted to present themselves for final examination unless they have been in attendance upon at least seven-eighths of the total of work.

Every person upon whom the degree is conferred must be of good moral character and must be at least twenty-one years old; must have attended two full lecture and laboratory courses, the last at this College, and must have passed a successful examination in the subjects required for graduation.

Drug-store experience is not a requirement for graduation.

Those who, without sufficient excuse, fail to appear for examination after having paid their full fee, will be permitted to present themselves at any subsequent examination, upon payment of an additional fee of five dollars, and complying with all other requirements.

## DEGREES

The College confers the degree of Bachelor of Pharmacy, Master of Pharmacy, and Doctor of Pharmacy for the completion of respectively the regular and the two graduate courses.

## FEES

### *Two-Year Regular Course*

|                          |          |
|--------------------------|----------|
| First-year tuition.....  | \$82.50  |
| Second-year tuition..... | 82.50    |
|                          | <hr/>    |
|                          | \$165.00 |

*Three-Year Regular Course*

|                                                     |          |
|-----------------------------------------------------|----------|
| First-year tuition.....                             | \$55.00  |
| Second-year tuition.....                            | 55.00    |
| Third-year tuition.....                             | 55.00    |
|                                                     | <hr/>    |
|                                                     | \$165.00 |
| Annual deposit covering all laboratories, etc.....  | \$5.00   |
| Second condition examination fee, each subject..... | 1.00     |

*First Graduate Course*

|                                |         |
|--------------------------------|---------|
| Tuition for each semester..... | \$10.00 |
| Annual deposit.....            | 5.00    |

There are no other tuition fees. Fees are payable at the time of registration. Those desiring to take special work will be required to pay an average of ten dollars a subject for the lecture courses and twenty-five dollars for the laboratory courses.

Students are to provide themselves with a designated set of metric weights, a set of apothecary's weights, steel spatulas, and note and drawing books. The expense of these may be kept within three dollars. Students using platinum crucibles are charged for them. Upon the return of the crucible in the original condition the charge is cancelled; if the crucible is in any wise damaged, the full value is collected from the student.

Fees will not be returned, except in case of discontinuance for sufficient reason, before the student has been assigned to a place in the laboratory.

A deposit of five dollars will be made with the Cashier each year, by every student, at the time of enrollment as a caution fee. The fee is intended to cover the cost of unnecessary damage to or in the college buildings and of breakage and loss of laboratory apparatus, material, penalties for late registration or late payment of fees, condition examinations, and the rental of post-office box, locker, etc. The unused balance will be returned to the student at the close of each year. If responsibility for such damage can not be individually fixed, a pro rata charge upon all students will be made.

In each laboratory course the student will be assigned a certain amount of apparatus and material, for which he will give a receipt. At the end of each course, if such apparatus and material are restored in good condition, this receipt will be returned to him. All apparatus lost or damaged will be charged to him and must be paid for before he can receive credits for his course or take his annual examinations.

## COLLEGE TRAINING FOR PHARMACISTS

The recognition of the need of substantial college training for pharmacists finds expression in many ways. In New York, Pennsylvania, Hawaii, Wisconsin, Ohio, Louisiana, and Washington, such training is obligatory either by law or by rule of the boards of pharmacy. In a

number of other states credit is given for college work. In Minnesota graduates from recognized colleges need to have had only two years of practical experience, while all others must have had four years of drug-store experience before they become eligible for examination by the State Board of Pharmacy for full license to practice in Minnesota. Graduates of the three-year course who have gained practical experience concurrently with their college work need only one additional year of drug-store experience before they become eligible for examination for full registration.

At the Joint Conference of the National Association of Boards of Pharmacy and the American Conference of Pharmaceutical Faculties, held at Indianapolis, Indiana, in September, 1906, the following resolution was adopted:

"Special education for the practice of pharmacy is in this age a necessity and should as rapidly as possible be made compulsory. The rules of the boards of pharmacy are such as to promote and encourage it in all practicable ways. The special pharmaceutical education should include substantial laboratory courses." The training advocated by these two most representative bodies and by the American Pharmaceutical Association can be obtained only at colleges or schools of pharmacy of recognized standing. It is admitted that the State of Minnesota through its University College of Pharmacy is affording instruction of the most approved kind.

In the organization of this college the Board of Regents and the Faculty have had the co-operation of the pharmacists of the State. The character of instruction is of high order and every effort is made to comply with the demands of the profession of the Northwest, or elsewhere, in the maintenance of a course of instruction of the highest grade.

### POSITIONS FOR GRADUATES

The demand for graduates of this College has always been greater than the supply and is continually growing. The rule is that practically all of the senior class are engaged before graduation. This College is recognized in all states, including those in which standards of efficiency have been established.

### STATE BOARD OF PHARMACY

The State Board of Pharmacy meets at the College four times each year to examine candidates for registration. For information concerning the Board or State examinations, address the Secretary of the Board, Mr. E. A. Tupper, 721 South 10th St., Minneapolis, Minnesota.

### COLLEGE OF PHARMACY ALUMNI ASSOCIATION

The Alumni Association of the College of Pharmacy meets annually, usually in the college building the day before Commencement, at 3 p.m. Every member of the Association is urgently requested to report change of address to the Secretary of the Association.

## THE AMERICAN CONFERENCE OF PHARMACEUTICAL FACULTIES

The College of Pharmacy of the University of Minnesota is one of the colleges constituting the membership of the American Conference of Pharmaceutical Faculties.

## COMMUNICATIONS

Address communications to the Dean, Professor Frederick J. Wulling, The University of Minnesota, Minneapolis, Minnesota.

## PHI DELTA CHI

The Theta chapter of the Phi Delta Chi fraternity was organized at the College of Pharmacy in 1904. Students of the College are eligible to membership.

## THE NORTHWESTERN BRANCH OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

The Northwestern Branch of the American Pharmaceutical Association, composed of the representative pharmacists of the Northwest, has its headquarters at the College of Pharmacy. About four meetings are held annually. Students of pharmacy are eligible to membership in the Branch, but are privileged to attend the meetings without becoming members.

## LARGER COLLEGE QUARTERS

Before the beginning of the 1913-14 college year the College will be housed in the reconstructed building formerly known as Millard Hall and henceforth to be known as the Pharmacy Building. The building is 60 by 115 feet in dimensions and four stories high. It is new in practically every respect, except the four outside walls, and is entirely fire-proof. The basement floor is devoted to a commercial pharmacognosy laboratory, camera, developing, printing, locker, store and toilet rooms. While this floor is called the basement, it really is not a basement, being almost entirely above ground. The first floor contains the regular pharmacognosy laboratory with preparation rooms, the Dean's offices and laboratory and the library. The second floor contains the lecture room with preparation rooms adjoining, a recitation room, and the dispensing laboratory with preparation and stock rooms adjoining. The top floor is devoted to the junior pharmaceutical laboratory and the senior pharmaceutical laboratory and the stock and preparation rooms. The heating, plumbing, and electrical equipment of the building is very complete. Every room is under thermostatic control. Every floor is abundantly equipped with gas, city water, hot water, high-pressure



steam, air pressure, and electric current for lighting and power. There is provision for stereopticon and demonstration lantern work on three floors. The furniture equipment will be almost entirely of steel. Very little, if any, wood will be used in the building.

Adjoining the Pharmacy Building and connected with it by a tunnel has been erected upon the ruins of the Old Anatomy Building a medicinal plant laboratory, 38 by 61 feet in dimensions, containing a full well-lighted basement for milling, distilling, and other similar purposes, and an upper floor to be used for the cultivation and housing of medicinal plants and to serve as a plant laboratory. Working space is provided for about sixty students at one time.

## COURSES OF STUDY

Three courses are offered, the regular and two graduate courses.

The complete regular course extends over two years of nine full months each. Students may arrange their work so as to take the course in three years. The twenty-second annual course begins on September 16, 1913, which is the last day on which students in pharmacy may register without a fine. The office of the Registrar is open for the purpose of registration as early as September 9, but students must first report at the Dean's office in the Pharmacy Building.

In addition to the regular course this College offers two graduate courses, the first continuing through one college year and leading to the degree of Master of Pharmacy and the second continuing through an additional year or longer, and leading to the degree of Doctor of Pharmacy. The first graduate course, the one leading to the Master's degree, is now in operation. The curriculum includes higher pharmaceutical chemistry, pharmaceutical assaying, higher organic chemistry, proximate and ultimate analysis, chemistry of food, water analysis, toxicology, spectroscopic work, therapeutics, clinical microscopy and bacteriology, and a thesis of at least 3,000 words, embodying the results of original work, but this curriculum may be changed by the Faculty if occasion or experience require.

The requirements for admission to the first graduate course are a diploma from a Minnesota high school of the first grade, or an equivalent; a diploma from a college of pharmacy whose curriculum, extent and kind of work, and length of undergraduate course are equal to those of this college; an acquaintance with either German or French sufficient to enable the student to read and understand the scientific literature of those languages. The fees for this course are ten dollars per semester. The rules relating to damage, waste, and breakage in laboratories are the same as those applying to the undergraduate course.

The course leading to the Doctor's degree will begin as soon as there are sufficient applicants.

## PROPOSED NEW COURSES

In September, 1914, or as soon as the proposed enlarged quarters of the College permit, two additional courses may be instituted: the one a lower and shorter than the regular course to conform to the minimum requirements of the American Conference of Pharmaceutical Faculties; the other, a higher than the regular course to lead to the degree of Bachelor of Science in Pharmacy and to include four years of work. The details have not yet been worked out, but it is probable that the former will include about two-thirds of the work of the regular course and will cover two years of at least six months each and that the entrance requirements will include one year of high school or equivalent training or whatever the entrance requirements of the Conference may be at the time.

The higher course will cover four years of nine months each and will include about two years of academic and cultural work. The qualifications for entrance to this course will be a full high-school training or an equivalent. Those presenting evidence of having completed the first two years of a collegiate course may complete the course in two years, providing the collegiate work completed includes certain subjects in the sciences and mathematics. Full announcement regarding these courses will be made duly.

## COURSES OF INSTRUCTION COMPRISING THE REGULAR PHARMACY COURSE

### FIRST YEAR

#### *First Quarter*

Botany 1, Comparative Morphology of the Cryptogams, six hours  
Pharmacy 9, Chemical Philosophy, five hours  
Pharmacy 1, History of Pharmacy; Pharmacy 2, Metrology; and Pharmacy 3, Physics of Pharmacy, six hours  
Chemistry 1, General, fifteen hours

#### *Second Quarter*

Botany 1, Comparative Morphology of the Cryptogams, six hours  
Pharmacy 10, Pharmaceutical Chemistry of the Non-Metals and their Preparations, three hours  
Pharmacy 3, Physics of Pharmacy, six hours  
Pharmacy 7, Pharmacy Quiz, one hour  
Chemistry 2, Qualitative Analysis, fifteen hours

#### *Third Quarter*

Botany 2, Morphology, Anatomy, and Classification of Higher Seed Plants, six hours  
Pharmacy 11, Pharmacopoeial Inorganic Salts and their Official Preparations; two hours  
Pharmacy 4, Pharmaceutical Processes, and Pharmacy 5, Pharmacopoeial Preparations, eight hours  
Pharmacognosy 1, Pharmacognosy of the Cryptogams, and Pharmacognosy 2, Pharmaco-Histology, three hours  
Pharmacy 7, Pharmacy Quiz, one hour  
Materia Medica 1, Inorganic Materia Medica, three hours  
Chemistry 5, Organic Chemistry, fifteen hours

#### *Fourth Quarter*

Botany 2, Morphology, Anatomy, and Classification of Higher Seed Plants, six hours  
Pharmacy 11, Pharmacopoeial Inorganic Salts and their Official Preparations, two hours

Materia Medica 1, Inorganic Materia Medica, three hours  
Pharmacy 5, Pharmacopoeial Preparations, and Pharmacy 6, Mathematics of Pharmacy, nine hours  
Pharmacy 7, Pharmacy Quiz, two hours  
Pharmacy 8, Identification of Inorganic Official Preparations, one hour  
Pharmacognosy 1, Pharmacognosy of the Cryptogams, and Pharmacognosy 2, Pharmaco-Histology, three hours  
Chemistry 5, Organic Chemistry, fifteen hours

## SECOND YEAR

*First Quarter*

Pharmacy 12, Classification of Pharmaceutical Organic Compounds, and Pharmacy 13, Chemistry of the Pharmacopoeial Organic Compounds and their Preparations, two hours  
Pharmacy 14, Pharmacopoeial Testing, sixteen hours  
Pharmacognosy 3 and 4, Pharmacognosy of the Angiosperms, and Pharmacognosy 5, Field Work, six hours  
Pharmacy 23, Identification of Salts, one hour  
Pharmacy 16, Incompatibility, and Pharmacy 17, Dispensing, twenty hours  
Materia Medica 2, Organic Materia Medica, three hours

*Second Quarter*

Pharmacy 13, Chemistry of the Pharmacopoeial Organic Compounds and their Preparations, two hours  
Pharmaceutical Mineralogy and Crystallography 1 and 2, four hours  
Pharmacognosy 3 and 4, Pharmacognosy of the Angiosperms, and Pharmacognosy 5, Field Work, six hours  
Pharmacy 18, Manufacture of Official Organic and Inorganic Salts and Preparations, fourteen hours  
Pharmacy 14, Pharmacopoeial Testing, ten hours  
Pharmacy 16, Incompatibility, and Pharmacy 17, Dispensing, twenty hours  
Pharmacy 23, Identification of Salts, one hour  
Materia Medica 2, Organic Materia Medica, three hours

*Third Quarter*

Pharmacognosy 3 and 4, Pharmacognosy of the Angiosperms, and Pharmacognosy 5, Field Work, nine hours  
Chemistry 3, Quantitative Analysis, nine hours  
Pharmacy 23, Identification of Salts, one hour  
Pharmacy 13, Chemistry of the Pharmacopoeial Organic Compounds and their Preparations, two hours  
Pharmacy 19, National Formulary, fifteen hours  
Therapeutics 3, Therapeutics, one hour  
Physiology 1, Physiology, Anatomy, and Histology, two hours

*Fourth Quarter*

Pharmacy 15, Quantitative Analysis of U. S. P. Salts and Preparations, five hours

Pharmacy 13, Chemistry of the Pharmacopoeial Organic Compounds and their Preparations, one hour

Pharmacy 23, Identification of Salts, one hour

Pharmacognosy 3 and 4, Pharmacognosy of the Angiosperms, and Pharmacognosy 5, Field Work, nine hours

Pharmacy 20, Pharmaceutical Assay; Pharmacy 21, Synthetic Remedies; Pharmacy 22, Homeopathic Pharmacy, and Pharmacy 24, Microchemistry, ten hours

Pharmacy Law, one and one-half hours

First Aids, one and one-half hours



## DEPARTMENTAL STATEMENTS

### BACTERIOLOGY

#### 1. General Bacteriology (Postgraduate)

Dr. WESBROOK

Twelve lecture and recitation hours and twelve laboratory hours per week; second year, fourth quarter.

Lectures and demonstrations. The general scope of bacteriology, the history of its development, and the biological and chemical problems involved in the life-history of bacteria will be dealt with. The classification of the various bacterial forms, the methods of isolation and culture, and the composition and manufacture of culture media will be studied until a thorough knowledge of technique is acquired. General and special study of the various antiseptics, disinfectants, and bactericidal substances and conditions will be undertaken.

Laboratory work, involving the making of their own culture media by the students, the study of bacteria in cultures and under the microscope, technique of staining and other methods, including observations of chemical and biological peculiarities, will be thoroughly carried out. Testing of various germicides—chemical and physical—and the use of bacteriological methods in the examination of drinking water will form an important part of the work.

### BOOK RESEARCH AND SEMINAR WORK

Throughout the year students are required to do book research and seminar work in the pharmaceutical library during certain periods released for the purpose from the pharmaceutical laboratory periods. Beginning with the coming year it is proposed to provide regularly in the College schedule two two-hour periods per week during the second semester of the graduating year for this kind of work. A room has been reserved for this purpose in the new Pharmacy Building. To make this work of the utmost value the pharmaceutical library is being enlarged. During the past year about 1,500 additional volumes have been added.

### BOTANY AND MICROSCOPY

FREDERIC E. CLEMENTS, Ph.D., Professor of Botany

FREDERIC K. BUTTERS, B.S., B.A., Assistant Professor of Botany

..... Assistant

1, 2, and 3: ten credits (seventy-two hours lecture, one hundred forty-four hours laboratory); first year.

#### 1. Comparative Morphology of the Cryptogams

Messrs. CLEMENTS and BUTTERS

The course embraces morphology of the cryptogams. Especial attention is paid to the green Algae, the foundation of the vegetable kingdom. The other groups of Algae and the Fungi are briefly treated, particular stress being laid on their economic relations to other plants, to animals, and to man. Examples of liverworts, mosses, ferns, and their allies are studied in the laboratory, and the line of development which leads from the Algae through the archegoniate series to the seed plants is emphasized.

## 2. The Morphology, Anatomy, and Classification of the Higher Seed Plants

Messrs. CLEMENTS and BUTTERS

Prerequisite, Botany 1.

In this course especial attention is paid to vegetable histology. The characteristic plant tissues are examined, and their arrangement is noted in roots, stems, leaves, fruit, and seeds. The formation and occurrence of carbohydrates, glucosides, alkaloids, organic acids, resins, gums, gum resins, and oleo-resins are carefully studied. Considerable time is devoted to the study of the basis of classification of flowering plants and to the identification of plants in the field.

## 3. Micro-Botany

Mr. BUTTERS

Designed to furnish practical training in the use of the microscope, in the preparation of material for microscopic examination, including the use of microchemical reagents, and in the representation by drawings of all structures observed.

The work of this course is coincident with that of 2 and 3.

# CHEMISTRY

GEORGE B. FRANKFORTER, M.A., Ph.D., Professor of Chemistry

CHARLES F. SIDENER, B.S., Professor of Quantitative Chemistry

EVERHART P. HARDING, M.S., Ph.D., Assistant Professor of Chemistry

IRA HARRIS DERBY, Ph.D., Assistant Professor of Chemistry

WILLIAM H. HUNTER, Ph.D., Instructor in Chemistry

## 1. General Chemistry

Messrs. DERBY and HUNTER

Five credits (forty-five hours lecture, ninety hours laboratory); first quarter, first year.

This course includes a study of the chemical properties of the metallic and non-metallic elements.

## 2. Qualitative Analysis

Messrs. DERBY and HUNTER

Five credits (forty-five hours lecture, ninety hours laboratory); second quarter, first year. Prerequisite, Chemistry 1.

This course covers the common reactions of the metals and acids and their qualitative separation. The ionic theory and the law of mass action are discussed with especial reference to qualitative reactions.

## 3. Quantitative Analysis

Mr. SIDENER and ASSISTANT

Three credits (twenty-seven hours lecture, fifty hours laboratory); third quarter, second year. Prerequisites, Chemistry 1 and 2.

A study of the principles of quantitative estimation, gravimetric, volumetric, and gasometric.

## 4. Toxicology, Water and Food Analysis (Postgraduate)

Messrs. FRANKFORTER, DERBY, and HARDING

Three and one-half credits (twenty-seven hours lecture, seventy-two hours laboratory); second quarter, second year.

The chemistry of the atmosphere, water, soil, etc.; the sanitary examination of air and water.

## 5. Organic Chemistry

Messrs. FRANKFORTER and HUNTER

Nine and one-half credits (seventy-two hours lecture, one hundred ninety-eight hours laboratory); third and fourth quarters, first year.

This course includes work in both the aliphatic and aromatic series and the preparation of the more important compounds.

## CLINICAL MICROSCOPY

## 1. Clinical Microscopy (Postgraduate)

Drs. ROBERTSON and HYNES

Instruction includes (a) the macroscopical study of urine, its colors, sediments, and finer chemical tests; (b) the microscopical study of urinary sediments, including blood, pus, epithelial cells, casts, etc.

## DISPENSARY PRESCRIPTION PRACTICE

The prescription dispensing for the Out-Patient Department of the University Hospitals at 1808 Washington Avenue South, Minneapolis, has lately been placed in charge of the College of Pharmacy. The senior students are sectioned into divisions of three or four for the purpose of doing practical prescription work at the dispensary under the direction of Mr. Blosmo. The dispensary practice continues throughout the college year.

## FIRST AIDS TO THE INJURED

## 1. Emergency Cases

Dr. McCloud

Two-thirds credit (twelve hours lecture); third quarter, second year.

A series of lectures designed to qualify the pharmacist to administer upon emergency cases before the arrival of the physician.

## MATERIA MEDICA AND THERAPEUTICS

EDGAR D. BROWN, Phm.D., M.D., Professor of Materia Medica and Therapeutics

CHARLES F. DIGHT, M.D., Lecturer in Materia Medica

.....Assistant in Materia Medica

## 1. Inorganic Materia Medica

Dr. BROWN and ASSISTANT

## 2. Organic Materia Medica

Dr. BROWN and ASSISTANT

Six credits (one hundred and eight hours lecture and recitation); third and fourth quarters, first year; first and second quarters, second year.

The work in inorganic and organic materia medica is based principally on the U. S. P., but unofficial and synthetic drugs are also studied. The course includes the study of the general characteristics of drugs and physiological action. Pharmacodynamics, including the study of the identity and quality of drugs, shares attention in the course in pharmacognosy.

## 3. Therapeutics

Drs. BROWN and DIGHT

One credit (eighteen hours lecture and recitation); third quarter, second year. Prerequisites, *Materia Medica* 1 and 2.

In this course drugs are studied in groups, as governed by their physiologic action, and the therapeutic features of such groups are described. Remedial measures other than those depending upon drugs are fully considered.

## PHARMACY

FREDERICK J. WULLING, Ph.G., Phm.D., LL.M., Professor of Pharmacology

GUSTAV BACHMAN, Phm.D., Phm.M., Assistant Professor of Pharmacy

OSCAR BLOSMO, Ph.C., Instructor in Dispensing

JOHN A. HANDY, Ph.C., B.S., Instructor in Pharmaceutical Chemistry

## 1. History of Pharmacy

Dr. WULLING

One-third credit (six hours lecture); first quarter, first year.

The history of the U. S. Pharmacopeia through all its revisions. Dispensatories, text-books, and works of reference.

## 2. Metrology

Drs. WULLING and BACHMAN and Mr. HANDY

Two-thirds credit (twelve hours lecture); first quarter, first year.

Weights and measures, including metric system; balances—construction, varieties, methods of weighing; specific gravity in detail; specific volume, alligation, etc.

## 3. The Physics of Pharmacy

Dr. WULLING and Messrs. BLOSMO and HANDY

Three credits (eighteen hours lecture, seventy-two hours laboratory); second quarter, first year. Prerequisite, Pharmacy 2.

Students are required to have had elementary physics before entering. This course covers a review and more extended elucidation of such divisions of physics as apply to pharmaceutical processes. Special attention is paid to heat. Specific heat; thermometers—the various scales, testing and comparing thermometers; combustion of solids, liquids, and gases in various kinds of furnaces, stoves, and burners; application of heat in drying ovens, steam, hot-air and water ovens; drying closets, desiccators, blowpipes, crucibles; baths for controlling and equalizing heat; evaporation—spontaneous, rapid, slow, in vacuo; ebullition—boiling points, fusion; sublimation, calcination, dehydration, torrefaction, roasting, reduction, oxidation, carbonization, deflagration, ignition, etc.; solution—pharmaceutical, simple, chemical, saturated; circulatory displacement; dialysis—construction of dialyser, osmosis, endosmosis, exosmosis, crystalloids, and colloids, etc.

## 4. Pharmaceutical Processes

Drs. WULLING and BACHMAN and Mr. BLOSMO

Three and one-half credits (twenty-four hours lecture, seventy-two hours laboratory); second quarter, first year. Prerequisite, Pharmacy 3.

The processes not taken up in Course 3 constitute the subjects of this course. In part they are: drug grinding and powdering; comminution; contusion; trituration; sifting; elutriation; levigation; lixiviation; filtration—filtering media, filtration of solutions, oils, syrups, rapid filtration, filtration in vacuo, hot filtration, colation; washing—displacement, continuous; decantation—the syphon and its uses; precipitation—methods, vessels, separating, drying, weighing; granulation—granular effervescent salts; desiccation; exsiccation; crystallization—water of crystallization, deliquescence, methods of obtaining crystals, collecting, draining, washing, drying crystals, fractional crystallization; distillation—simple, fractional, destructive; extraction; maceration; expression; percolation—history, theories, percolators, exhaustion, repercolation, continuous percolation, fractional percolation; clarification; decolorization.

## 5. Pharmacopoeial Preparations

Drs. WULLING and BACHMAN and Mr. BLOSMO

Five credits (thirty hours lecture, one hundred twenty hours laboratory); third and fourth quarters, first year.

This course includes the study and preparation of official bodies for which the U. S. P. gives formulae and processes, and includes waters, solutions, syrups, mucilages, spirits, infusions, decoctions, tinctures, fluid extracts, vinegars, wines, liniments, oleates, ointments, cerates, resins, oleo-resins, honeys, glycerites, mixtures, emulsions, elixirs, collodions, pills, capsules, powders, suppositories, bougies, plasters, papers, cachets, etc.

## 6. Mathematics of Pharmacy

Drs. WULLING and BACHMAN and Mr. HANDY

While students are required to have a preparation in Arithmetic and Algebra before entering, they receive frequent drills at stated hours and as occasion requires or suggests throughout the entire course. Students are required to take final examinations in the subject at the end of the first and second year, at which examination they must attain a rating of at least eighty per cent.

## 7. Pharmacy Quiz

Dr. BACHMAN

Three credits (fifty-four hours); second, third, and fourth quarters, first year. Prerequisites, Pharmacy 2, 3, 4, and 5.

A thorough review of the work covered in Courses 2, 3, 4, and 5.

## 8. Identification of Inorganic Official Preparations

Dr. BACHMAN

One credit (eighteen hours); fourth quarter, first year.

The study of the physical properties of official preparations.

## 9. Chemical Philosophy

Dr. WULLING

One and one-half credits (twenty-seven hours lecture); first quarter, first year.

Treats of the principles underlying chemistry and endeavors to elucidate chemical facts and phenomena. The subject is divided into chemical statics, embracing the study of the theories of atoms and molecules, atomic weights, atomic and molecular volume, quantivalence, molecular structure, ions, electric qualities, etc., and chemical dynamics, the study of reactions and their equations, thermics, chemical properties in general, etc.

## 10. The Pharmaceutical Chemistry of the Non-Metals and their Preparations

Dr. WULLING

One and one-half credits (twenty-seven hours lecture); second quarter, first year. Prerequisite, Pharmacy 9.

## 11. Pharmacopoeial Inorganic Salts and their Official Preparations

Dr. WULLING

Three credits (fifty-four hours lecture); third and fourth quarters, first year. Prerequisite, Pharmacy 10.

Especial reference to description, properties, and manufacture.

## 12. Classification of Pharmaceutical Organic Compounds

Dr. WULLING

One credit (eighteen hours lecture); first quarter, second year.

A preparation for Pharmacy 13.



13. Chemistry of the Pharmacopoeial Organic Compounds and their Preparations Dr. WULLING and Mr. HANDY

Three credits (fifty-four hours lecture); entire second year. Prerequisite, Pharmacy 12.

This course includes the critical study of cellulose and its derivatives, destructive distillation products, starches, sugars, fermentation products, organic acids, fixed oils and fats, volatile oils, waxes, and animal fats, alkaloids, glucosides, animal drugs and products, etc.

14. Pharmacopoeial Testing

Drs. WULLING and BACHMAN and Mr. HANDY

Five credits (thirty-six hours lecture, one hundred and eight hours laboratory); first and second quarters, second year.

A critical study of the identity, purity, limit, and percentage tests of the Pharmacopoeia and their application either wholly or in part to practically every official organic and inorganic salt and compound.

15. Quantitative Analysis of U. S. Salts and Preparations

Drs. WULLING and BACHMAN and Mr. HANDY

Two credits (eighteen hours lecture, thirty-six hours laboratory); fourth quarter, second year. Prerequisites, Chemistry 3 and Pharmacy 14.

This course includes the gravimetric, volumetric, and gasometric determinations of the U. S. Pharmacopoeia, but not pharmaceutical assay work (20).

16. Incompatibility

Drs. WULLING and BACHMAN

One-half credit (nine hours lecture); first and second quarters, second year.

Therapeutic, pharmaceutical, and chemical incompatibility is taken up in lecture and recitation work preliminary to 17.

17. Dispensing

Drs. WULLING and BACHMAN

Five and one-half credits (twenty-seven hours lecture, one hundred and forty-four hours laboratory); first and second quarters, second year. Prerequisite, Pharmacy 16.

The study of the prescription and practical work in dispensing upwards of one hundred typical prescriptions.

18. Manufacture of Official Organic and Inorganic Salts and Preparations

Drs. WULLING and BACHMAN and ASSISTANT

Four and one-third credits (twenty-four hours lecture, one hundred and eight hours laboratory); second quarter, second year.

The preparation of about forty official salts included in the course.

19. National Formulary

Drs. WULLING and BACHMAN

One credit (six hours lecture, twenty-four hours laboratory); third quarter, second year.

This course, lecture and laboratory, includes the study of the National Formulary and the making of one or more members of each class of preparations.

20. Pharmaceutical Assay

Drs. WULLING and BACHMAN and Mr. HANDY

One and one-third credits (six hours lecture, thirty-six hours laboratory); fourth quarter, second year. Prerequisites, Pharmacy 14 and Chemistry 3.

The quantitative determination of active constituents of a number of the potent organic drugs and preparations.

21. Synthetic Remedies Dr. WULLING

One-third credit (six hours lecture); fourth quarter, second year.  
Prerequisites, Pharmacy 12 and 13 and Chemistry 4.

A study of the chemistry of synthetic remedies in medical use.

22. Homeopathic Pharmacy Drs. WULLING and BACHMAN

Fourth quarter, second year.

A brief exposition of the principles underlying homeopathic medication, with some laboratory work.

23. Identification of Salts Dr. BACHMAN

One and one-half credits (thirty-six hours laboratory); entire second year.

The study of the physical identity of the more important official inorganic and organic salts.

24. Microchemistry Dr. WULLING

Fourth quarter, second year. Optional.

A brief course is provided for seniors if time permits.

### PHARMACEUTICAL JURISPRUDENCE

1. Law for Pharmacists Dr. WULLING

Two-thirds credit (twelve hours lecture); fourth quarter, second year.

The lectures introduce the subjects of contracts, agency, commercial paper, and insurance, and discuss the liability of retail and manufacturing pharmacists, etc.

### PHARMACEUTICAL MINERALOGY AND CRYSTALLOGRAPHY

1. Mineralogy Mr. GROUT

One credit (eighteen hours lecture); second quarter, second year.

A study of the occurrence and properties of minerals of pharmaceutical importance; ores of metals used in pharmacy; non-metallic minerals and mineral waters in their mineralogic and geologic relations.

2. Crystallography Mr. GROUT

One credit (eighteen hours lecture); second quarter, second year.  
Prerequisite, Mineralogy 1.

A survey of form and more evident physical characters as a basis for practice in sight recognition of economic minerals and their distinction from common rocks.

### PHARMACOGNOSY

The courses in Pharmacognosy are designed to give the student that specific training which will enable him to determine the identity and quality of both crude and powdered vegetable drugs. Some attention

is given in these courses to the methods and results of pharmaco-physiological research.

.....Professor of Pharmacognosy  
 EDWIN L. NEWCOMB, P.D., Assistant Professor of Pharmacognosy  
 (At present in charge of the work)  
 .....Assistant

Courses 1 and 2 Dr. NEWCOMB and ASSISTANT

Together, two credits (eighteen hours lecture, thirty-six hours laboratory); second semester, first year.

### 1. Pharmacognosy of the Cryptogams

In this course many of the valuable drugs and economic products obtained from the cryptogams are studied.

### 2. Pharmacology-Histology

This course is designed to complete the preparation of the student for the senior work in Pharmacognosy. It includes micrometry and the detailed study of the inner structure of the parts of the higher plants as illustrated in about forty official and unofficial drugs.

Courses 3, 4, and 5 Dr. NEWCOMB and ASSISTANT

Together, ten credits (one hundred eight hours lecture, two hundred sixteen hours laboratory, including field work); first and second semester, second year. Prerequisites, Pharmacognosy 1; Botany 1, 2, and 3.

### 3 and 4. Pharmacognosy of the Angiosperms

In this course the time is devoted to the scientific study, both macroscopically and microscopically, of the official and of some of the unofficial vegetable drugs. The work naturally divides itself into the study of crude drugs (Course 3) and of powdered drugs (Course 4).

For convenience and purposes of comparison drugs will be studied under Course 3 in the following order: seeds, roots, and rhizomes; barks, woods, and pith; flowers; fruits; leaves and herbs; exudations and other plant products. Here or at some other consistent place animal drugs and plant and animal fibers will be studied.

In Course 4 the more important vegetable drugs occurring in powdered form are examined and studied microscopically. The adulterants of powdered drugs and their detection are given considerable attention.

### 5. Field Work

In the spring of the year and at other suitable times the classes are taken on field excursions to search for native medicinal plants. The study of the distinguishing characteristics of certain orders, families, and genera, to which the medicinal plants belong, is included in this work.

## PHYSIOLOGY

RICHARD OLDING BEARD, M.D., Professor of Physiology  
 FREDERICK H. SCOTT, B.A., Ph.D., M.B., D.Sc., Assistant Professor of  
 Physiology  
 CHAUNCEY J. V. PETTIBONE, B.S., Instructor in Physiology

## 1. Physiology

Drs. BEARD and SCOTT and Mr. PETTIBONE

One credit (eighteen hours lecture and recitation); third quarter, second year.

The work covers the study of the physiological properties of the cell, the nutritive media, the nervous mechanisms in general, muscular tissues, connective tissues, and epithelial tissues. The subjects of anatomy and histology are touched upon sufficiently to lay the foundation for the proper understanding of physiological functions. Special attention is directed to the action of drugs and their effects upon the various systems.

## 2. Qualitative and Quantitative Urinalysis (Postgraduate)

Drs. BEARD and SCOTT

One credit (nine hours lecture, eighteen hours laboratory); second semester. Prerequisite, Physiology 1.

Lectures, recitations, and laboratory work. The laboratory work includes the qualitative analysis of representative specimens of urine as regards their physical properties, inorganic and organic constituents, as well as the quantitative determination of chlorides, urea, ammonia, total nitrogen, sugar and albumin, together with the preparation of reagents.

## 3. Experimental Physiology (Postgraduate)

Drs. BEARD and SCOTT

Four credits (thirty-six hours lecture, seventy-two hours laboratory); second semester. Prerequisite, Physiology 2.

Laboratory work and demonstrations. A study of physiologic apparatus, electric stimuli, and methods of experimentation; the demonstration and performance of experiments which illustrate physiologic function in the muscular, nervous, vascular, respiratory and glandular systems; and the study of the cardiac areas, the heart and respiratory sounds, and of pulse tracings, including training in the use of the sphygmograph, the stethoscope, phonendoscope, etc.

## 4. Physiologic Chemistry and Microscopy (Postgraduate)

Drs. BEARD and SCOTT

Eight credits (seventy-two hours lecture, one hundred and forty-four hours laboratory); first semester. Prerequisite, Physiology 3.

Laboratory work and demonstrations. A practical study of the several classes of proteids; of carbohydrates, fats, muscle, and bone; of gastric juice, saliva, pancreatic juice, and bile in their respective digestions; of glycogen, and of blood lymph, chyle, and milk. Microscopic study of the carbohydrates in vegetable and animal forms; of the physiologic emulsions of fat; of the crystalline waste products, and of the physiologic conditions of the blood cells and of blood crystals. Practical instruction is given during this course in the enumeration of blood cells, in the estimation of haemoglobin and of the corpuscles in mass, in the spectroscopic examination of the blood in the determination of blood tests and in the use of polariscope.

## MINNESOTA PHARMACY LAW

Several lectures elucidating the rights, duties, privileges, and liabilities of pharmacists under the State law regulating the practice of pharmacy, are given by special lecturers near the close of the second year.

## SPECIAL LECTURES

From twelve to fifteen special lectures on subjects related to the practice of pharmacy are delivered by well-known pharmacists and others at intervals during the college year.

## LECTURE AND LABORATORY SCHEDULES

Lecture and laboratory schedules will be posted on the college bulletin in September.

The college year is divided into four quarters, the first and second constituting the first semester, and the third and fourth, the second semester. The college year covers nine full months or thirty-eight weeks. Each quarter consists of nine working weeks. To the second and fourth quarters, one examination week is added.



# STUDENTS

## GRADUATE STUDENTS—3

Blosmo, Oscar J., Minneapolis

Handy, John A., Minneapolis

Haynes, Manley H., Minneapolis

## SENIORS—33

Ames, Harry A., Minneapolis

Ash, Ben S., Delano

Barber, Ralph C., Long Prairie

Beedy, Harry V., Minneapolis

Blaustein, Hynie, Minneapolis

Brown, Alfred C., Minneapolis

Cannon, Raymond W., Minneapolis

Clark, A. Kelley, River Falls, Wis.

Cohen, Ben M., Minneapolis

Davidson, G. Milnor, Minneapolis

Errickson, Alfred, Cashton, Wis.

Ertel, Liguori M., Maple Lake

Graham, Thomas E., Park Rapids

Grain, Albert, Gibbon

Green, Fred H., Hankinson, N. D.

Hoppe, Alfred G., Minneapolis

Hutchinson, Roy, Duluth

Irish, Horace D., Des Moines, Iowa

Johnson, Archie O., Hudson, Wis.

Knatterud, Christian S., Spring Grove

Laue, Edwin R., New Ulm

Mee, James J., Gaylord

Micklesen, Walter H., Hudson, Wis.

O'Brien, Frank P., Eden Valley

Ostedt, Joseph H., St. Paul

Pope, Samuel L., St. Hilaire

Remer, Edwin A., Little Falls

Remington, Porter B., Minneapolis

Rempel, Peter J., Butterfield

Schreiter, Norman C., Red Lake Falls

Strimling, Joseph, Minneapolis

Watson, Hugh M., St. Charles

Young, Clift H., Fergus Falls

## JUNIORS—49

\*Abramovitz, Samuel H., Minneapolis

Anderson, Henry B., Stillwater

Backman, Cleve, Goodhue

Bartleson, Rasmus, Thief River Falls

Blomquist, Arthur T., Foreston

Brom, Harry E., Morris

Burkhardt, Frank R., Milbank, S. D.

Christianson, Harry W., Belgrade

Dargavel, John W., Morristown

Duensing, Minnie, Minneapolis

Dunnum, Albert L., Leith, N. D.

Epstein, Abe L., Minneapolis

Erpelding, J. Kenneth, Adrian

Fischer, Earl B., Mound City, S. D.

Fitzgerald, Edward, Mondovi, Wis.

Fournier, Joseph O., Minneapolis

Giese, Milton G., Menomonie, Wis.

Gumprecht, Henry, Minneapolis

Hague, Ellsworth, Maiden Rock, Wis.

Hast, Theodore J., Andrew, Iowa

Herchmer, J. Lyndale, Kamloops, B. C.

Hildebrandt, William E., Hibbing

Hill, Roy L., Minneapolis

Holm, Noel, Minneapolis

Hyde, Walter K., Savanna, Ill.

Jardine, Ethel A., Minneapolis

Jensen, Louis C., Verdon, S. D.

Lawler, Lawrence, Minneapolis

Meyer, Harold E., Twin Valley

Mix, Irl D., Cedar Falls, Iowa

Niemi, Arthur, Hibbing

Norin, Lenus A., Minneapolis

Olson, Olive F., Tyler

Peterson, Rudolph, Minneapolis

Reed, Frank W., Vinton, Iowa

Roen, Helmer A., Menomonie, Wis.

Rotegard, Bernard C., New Richland

Schatz, Emilia A., Montgomery

Scott, Roy T., Minneapolis

Setterholm, Arthur, Argyle

Stromsmoe, Alvin M., Minneapolis

Swanson, Carl A., St. Paul

Treacy, Arthur J., St. Paul

Wallen, Alvin U., Henning

Wallraff, Winn E. A., St. Paul

Weisman, Harry L., Minneapolis

Weisman, Sam A., Minneapolis

Wright, Charles E., Minneapolis

Young, William, Minneapolis

## UNCLASSIFIED—1

Rosenthal, Joseph, Minneapolis

\*Deceased.









Q  
M66wZph  
1914-15.

THE LIBRARY  
OF THE  
UNIVERSITY OF ILLINOIS

# The University of Minnesota

## THE COLLEGE OF PHARMACY

1914-1915



BULLETIN OF THE UNIVERSITY OF MINNESOTA  
VOL. XVII, NO. 10. JUNE 1914

Entered at the Post-Office  
in Minneapolis as second-class matter  
Minneapolis, Minn.



The Bulletin of the University of Minnesota is issued as often as twice a month during the University year.

---

The Bulletin comprises—

*Original Series.* Containing the reports of the President and of the Board of Regents, the Register, the Bulletin of General Information, the annual announcements of the individual colleges of the University, etc.

*General Series.* Containing announcements of departments of instruction, reports of University officers, etc.

These publications will be sent gratuitously to all persons who apply for them. The applicant should state specifically which announcement or what information is desired. Address

The REGISTRAR,  
The University of Minnesota,  
Minneapolis, Minnesota.

*Research Publications.* Containing results of research work. Papers will be published as separate monographs numbered in several series.

*School of Mines Experiment Station Series.* Containing results of investigations conducted by the Station.

*Current Topics Series.* Containing papers of general interest in various lines of work.

These publications are free to residents of the State. To others a small charge is made. They are offered for exchange with institutions publishing similar material. Address

The LIBRARIAN,  
The University of Minnesota,  
Minneapolis, Minnesota.

# The University of Minnesota

## THE COLLEGE OF PHARMACY

1914-1915



BULLETIN OF THE UNIVERSITY OF MINNESOTA  
VOL. XVII, NO. 10. JUNE 1914

Entered at the Post-Office  
in Minneapolis as second-class matter  
Minneapolis, Minn.

| 1914      |    |    |    |    |    |    | 1915     |    |    |    |    |    |    |
|-----------|----|----|----|----|----|----|----------|----|----|----|----|----|----|
| JULY      |    |    |    |    |    |    | JANUARY  |    |    |    |    |    |    |
| Su        | Mo | Tu | W  | Th | Fr | Sa | Su       | Mo | Tu | W  | Th | Fr | Sa |
| ..        | .. | .. | 1  | 2  | 3  | 4  | ..       | .. | .. | .. | 1  | 2  | .. |
| 5         | 6  | 7  | 8  | 9  | 10 | 11 | 3        | 4  | 5  | 6  | 7  | 8  | 9  |
| 12        | 13 | 14 | 15 | 16 | 17 | 18 | 10       | 11 | 12 | 13 | 14 | 15 | 16 |
| 19        | 20 | 21 | 22 | 23 | 24 | 25 | 17       | 18 | 19 | 20 | 21 | 22 | 23 |
| 26        | 27 | 28 | 29 | 30 | 31 | .. | 24       | 25 | 26 | 27 | 28 | 29 | 30 |
| ..        | .. | .. | .. | .. | .. | .. | 31       | .. | .. | .. | .. | .. | .. |
| AUGUST    |    |    |    |    |    |    | FEBRUARY |    |    |    |    |    |    |
| ..        | .. | .. | .. | .. | .. | 1  | ..       | 1  | 2  | 3  | 4  | 5  | 6  |
| 2         | 3  | 4  | 5  | 6  | 7  | 8  | 7        | 8  | 9  | 10 | 11 | 12 | 13 |
| 9         | 10 | 11 | 12 | 13 | 14 | 15 | 14       | 15 | 16 | 17 | 18 | 19 | 20 |
| 16        | 17 | 18 | 19 | 20 | 21 | 22 | 21       | 22 | 23 | 24 | 25 | 26 | 27 |
| 23        | 24 | 25 | 26 | 27 | 28 | 29 | 28       | .. | .. | .. | .. | .. | .. |
| 30        | 31 | .. | .. | .. | .. | .. | ..       | .. | .. | .. | .. | .. | .. |
| SEPTEMBER |    |    |    |    |    |    | MARCH    |    |    |    |    |    |    |
| ..        | .. | 1  | 2  | 3  | 4  | 5  | ..       | 1  | 2  | 3  | 4  | 5  | 6  |
| 6         | 7  | 8  | 9  | 10 | 11 | 12 | 7        | 8  | 9  | 10 | 11 | 12 | 13 |
| 13        | 14 | 15 | 16 | 17 | 18 | 19 | 14       | 15 | 16 | 17 | 18 | 19 | 20 |
| 20        | 21 | 22 | 23 | 24 | 25 | 26 | 21       | 22 | 23 | 24 | 25 | 26 | 27 |
| 27        | 28 | 29 | 30 | .. | .. | .. | 28       | 29 | 30 | 31 | .. | .. | .. |
| ..        | .. | .. | .. | .. | .. | .. | ..       | .. | .. | .. | .. | .. | .. |
| OCTOBER   |    |    |    |    |    |    | APRIL    |    |    |    |    |    |    |
| ..        | .. | .. | 1  | 2  | 3  | .. | ..       | .. | .. | 1  | 2  | 3  | .. |
| 4         | 5  | 6  | 7  | 8  | 9  | 10 | 4        | 5  | 6  | 7  | 8  | 9  | 10 |
| 11        | 12 | 13 | 14 | 15 | 16 | 17 | 11       | 12 | 13 | 14 | 15 | 16 | 17 |
| 18        | 19 | 20 | 21 | 22 | 23 | 24 | 18       | 19 | 20 | 21 | 22 | 23 | 24 |
| 25        | 26 | 27 | 28 | 29 | 30 | 31 | 25       | 26 | 27 | 28 | 29 | 30 | .. |
| ..        | .. | .. | .. | .. | .. | .. | ..       | .. | .. | .. | .. | .. | .. |
| NOVEMBER  |    |    |    |    |    |    | MAY      |    |    |    |    |    |    |
| 1         | 2  | 3  | 4  | 5  | 6  | 7  | ..       | .. | .. | .. | .. | 1  | .. |
| 8         | 9  | 10 | 11 | 12 | 13 | 14 | 2        | 3  | 4  | 5  | 6  | 7  | 8  |
| 15        | 16 | 17 | 18 | 19 | 20 | 21 | 9        | 10 | 11 | 12 | 13 | 14 | 15 |
| 22        | 23 | 24 | 25 | 26 | 27 | 28 | 16       | 17 | 18 | 19 | 20 | 21 | 22 |
| 29        | 30 | .. | .. | .. | .. | .. | 23       | 24 | 25 | 26 | 27 | 28 | 29 |
| ..        | .. | .. | .. | .. | .. | .. | 30       | 31 | .. | .. | .. | .. | .. |
| DECEMBER  |    |    |    |    |    |    | JUNE     |    |    |    |    |    |    |
| ..        | .. | 1  | 2  | 3  | 4  | 5  | ..       | .. | 1  | 2  | 3  | 4  | 5  |
| 6         | 7  | 8  | 9  | 10 | 11 | 12 | 6        | 7  | 8  | 9  | 10 | 11 | 12 |
| 13        | 14 | 15 | 16 | 17 | 18 | 19 | 13       | 14 | 15 | 16 | 17 | 18 | 19 |
| 20        | 21 | 22 | 23 | 24 | 25 | 26 | 20       | 21 | 22 | 23 | 24 | 25 | 26 |
| 27        | 28 | 29 | 30 | 31 | .. | .. | 27       | 28 | 29 | 30 | .. | .. | .. |
| JULY      |    |    |    |    |    |    | AUGUST   |    |    |    |    |    |    |
| Su        | Mo | Tu | W  | Th | Fr | Sa | Su       | Mo | Tu | W  | Th | Fr | Sa |
| ..        | .. | .. | .. | 1  | 2  | 3  | 1        | 2  | 3  | 4  | 5  | 6  | 7  |
| 4         | 5  | 6  | 7  | 8  | 9  | 10 | 8        | 9  | 10 | 11 | 12 | 13 | 14 |
| 11        | 12 | 13 | 14 | 15 | 16 | 17 | 15       | 16 | 17 | 18 | 19 | 20 | 21 |
| 18        | 19 | 20 | 21 | 22 | 23 | 24 | 22       | 23 | 24 | 25 | 26 | 27 | 28 |
| 25        | 26 | 27 | 28 | 29 | 30 | 31 | 29       | 30 | 31 | .. | .. | .. | .. |
| ..        | .. | .. | .. | .. | .. | .. | ..       | .. | .. | .. | .. | .. | .. |

# UNIVERSITY CALENDAR

1914-1915

The University year covers a period of thirty-eight weeks, beginning on the second Tuesday in September. Commencement Day is always the second Thursday in June.

## 1914

|           |      |           |                                                                                                                  |
|-----------|------|-----------|------------------------------------------------------------------------------------------------------------------|
| September | 1    | Tuesday   | Registration closes except for new students                                                                      |
| September | 1-8  | Week      | Fees payable except for new students                                                                             |
| September | 8-15 | Week      | Examinations for removal of conditions, entrance examinations, registration of new students, and payment of fees |
| September | 9-15 | Week      | Military encampment of cadets                                                                                    |
| September | 16   | Wednesday | First semester begins                                                                                            |
| November  | 25   | Wednesday | Thanksgiving recess begins 9:00 p.m.                                                                             |
| November  | 30   | Monday    | Thanksgiving recess ends 8:00 a.m.                                                                               |
| December  | 18   | Friday    | Christmas vacation begins 9:00 p.m.                                                                              |

## 1915

|          |    |           |                                            |
|----------|----|-----------|--------------------------------------------|
| January  | 5  | Tuesday   | Christmas vacation ends 8:00 a.m.          |
| January  | 19 | Tuesday   | Registration for second semester closes    |
| January  | 25 | Monday    | Final examinations begin                   |
| January  | 26 | Tuesday   | Payment of fees for second semester closes |
| February | 3  | Wednesday | Second semester begins                     |
| February | 11 | Thursday  | First semester class reports due           |
| February | 12 | Friday    | Lincoln's Birthday: a holiday              |
| February | 22 | Monday    | Washington's Birthday: a holiday           |
| March    | 31 | Wednesday | Easter recess begins 9:00 p.m.             |
| April    | 8  | Thursday  | Easter recess ends 8:00 a.m.               |
| May      | 29 | Saturday  | Final examinations begin                   |
| June     | 5  | Saturday  | Second semester closes                     |
| June     | 6  | Sunday    | Baccalaureate service                      |
| June     | 7  | Monday    | Senior class day exercises                 |
| June     | 9  | Wednesday | Alumni Day                                 |
| June     | 10 | Thursday  | Forty-third Annual Commencement            |
| June     | 11 | Friday    | Summer vacation begins                     |
| June     | 14 | Monday    | Summer Session begins                      |

The University year for 1915-16 will begin Tuesday, September 7.

NOTE.—During the year 1913-14 there were 101 recitation days the first semester and 98 the second, inclusive of the final examination periods. In 1914-15 the number of recitation days will be exactly the same.





# THE COLLEGE OF PHARMACY

## FACULTY

- GEORGE EDGAR VINCENT, Ph.D., LL.D., President 1005 5th St. S. E.  
CYRUS NORTHROP, LL.D., President, Emeritus 519 10th Ave. S. E.  
FREDERICK J. WULLING, Ph.G., Phm.D., LL.M., Dean, Professor of  
Pharmacology, and Director of the University Medicinal Plant Gar-  
dens 3305 2nd Ave. S.  
GUSTAV BACHMAN, Phm.D., Phm.M., Assistant Professor of Pharmacy  
2624 Fremont Ave. S.  
RICHARD OLDING BEARD, M.D., Associate Professor of Physiology  
The University of Minnesota  
HERBERT F. BERGMAN, B.S., Assistant Professor of Botany  
723 7th St. S. E.  
EDGAR D. BROWN, Phm.D., M.D., Associate Professor of Pharmacology  
3525 3rd Ave. S.  
FREDERIC K. BUTTERS, B.S., B.A., Assistant Professor of Botany  
815 S. 7th St.  
FREDERIC E. CLEMENTS, Ph.D., Professor of Botany 800 4th St. S. E.  
IRA H. DERBY, Ph.D., Assistant Professor of Chemistry  
2157 Commonwealth Ave., St. Paul  
GEORGE B. FRANKFORTER, M.A., Ph.D., Professor of Chemistry  
525 E. River Road  
FRANK F. GROUT, M.S., Assistant Professor of Geology and Mineralogy  
623 13th Ave. S. E.  
EVERHART P. HARDING, Ph.D., Associate Professor of Chemistry  
1316 7th St. S. E.  
NED L. HUFF, M.S., Assistant Professor of Botany 1219 7th St. S. E.  
WILLIAM H. HUNTER, Ph.D., Assistant Professor of General and Qualita-  
tive Chemistry 112 Church St. S. E.  
WINFORD P. LARSON, M.D., Assistant Professor of Bacteriology  
614 9th Ave. S. E.  
EDWIN L. NEWCOMB, P.D., Phm.M., Associate Professor of Pharmaceut-  
ical Botany and Pharmacognosy 719 6th Ave. S. E.  
\*HAROLD E. ROBERTSON, B.A., M.D., Professor of Bacteriology  
507 Essex St. S. E.  
CARL O. ROSENDAHL, Ph.D., Professor of Botany  
2191 Commonwealth Ave., St. Paul  
†FREDERICK H. SCOTT, Ph.D., M.D., D.Sc., Associate Professor of Phys-  
iology 1307 6th St. S. E.  
CHARLES F. SIDENER, B.S., Professor of Quantitative Chemistry  
1320 5th St. S. E.  
OSCAR J. BLOSMO, Ph.C., Phm.M., Instructor in Dispensing  
529 Oak St. S. E.

\*On leave of absence 1914-15.

†On leave of absence first semester 1914-15.

- ARTHUR T. HENRICI, M.D., Instructor in Bacteriology 2443 Garfield Ave.  
JOHN ELDON HYNES, Ph.C., M.D., Instructor in Medicine  
3349 University Ave. S. E.  
WOLF KRITCHEVSKY, D.Sc., Instructor in Chemistry 568 6th Ave. N.  
CHAUNCEY J. V. PETTIBONE, Ph.D., Instructor in Physiology  
112 Church St. S. E.  
CHARLES H. ROGERS, B.S. in Pharm., Instructor in Pharmaceutical Chem-  
istry and Pharmacy 826 University Ave. S. E.  
E. K. STRACHAN, Ph.D., Instructor in Chemistry  
826 University Ave. S. E.  
MARGARET WARWICK, B.S., M.D., Instructor in Bacteriology  
1516 7th St. S. E.  
DONALD FOLSOM, B.A., Assistant in Botany 619 9th Ave. S. E.  
C. NAUMANN McCLOUD, Phm.D., M.D., Lecturer on First Aids to the  
Injured 524 Lowry Bldg., St. Paul  
JAMES L. TITUS, Phm.B., Assistant Instructor in Dispensing  
300 Washington Ave. S. E.  
D. D. TURNER, Ph.C., Assistant Laboratory Instructor 1205 5th St. S. E.

## GENERAL INFORMATION

{ Beginning with September, 1915 the completion of a regular four-year high-school course or its equivalent will be required for admission. For detailed statement of entrance requirements, registration, and fees, see Bulletin of General Information.

### COURSES OF STUDY

Of the five graded courses authorized by the Regents those leading to the degrees Graduate in Pharmacy, Pharmaceutical Chemist, and Master of Pharmacy are now offered. Only the course leading to the first degree is described in this bulletin, but a limited number of applicants for the courses leading to the second and third degrees will be accepted now. Up to and including September, 1917 graduates from the first course are admitted to the course leading to the Master's degree. All who apply for entrance upon the Master's course in September, 1918 must possess the Ph.C. degree, and in September, 1919 and thereafter the degree Bachelor of Science in Pharmacy. A limited number of graduates from this or other colleges maintaining an equivalent standard, having the Master's or an equivalent degree, will be accepted for advanced standing in the course leading to the degree Bachelor of Science in Pharmacy in September, 1914 and thereafter as the facilities of the College may permit.

It is now certain that the lower and shorter than the regular course mentioned as a possibility in former bulletins will not be offered.

### DEGREES

This College now has authority to grant the degrees Graduate in Pharmacy (Ph.G.) for two years of work, Pharmaceutical Chemist (Ph.C.) for three years, Bachelor of Science in Pharmacy (B.S. in Pharm.) for four years, Master of Pharmacy (Phm.M.) for five years, and Doctor of Pharmacy (Phm.D.) for six years of work. In this and all other respects this College fully meets the requirements of the Education Department of the State of New York. The master's and doctor's degrees will ultimately be given by the Graduate School.

### GRADUATION REQUIREMENTS

Regular attendance at lectures, recitations, and laboratory exercises is required. Students will not be permitted to present themselves for final examination unless they have been in attendance upon at least seven eighths of the total of work of the course.

Every person upon whom the degree Graduate in Pharmacy is conferred must be of good moral character and must be at least twenty-one years old; must have attended two full lecture and laboratory courses,

the last at this College, and must have passed successful examinations in the subjects required for graduation.

Drug-store experience is not a requirement for graduation.

Those who, without sufficient excuse, fail to appear for examination after having paid their full fee, will be permitted to present themselves at any subsequent examination, upon payment of an additional fee of five dollars, and complying with all other requirements.

#### ADVANCED STANDING

Applicants for advanced standing must pass the entrance examinations or present the usual equivalents. They must furnish satisfactory evidence of time spent and subjects covered in previous professional studies, and must pass the examinations of all departments in which they wish to be exempt, if such examinations are deemed necessary by the professors in charge. Students will not be permitted to substitute private work in any branch for the regular course work.

#### UNCLASSED STUDENTS

Unclassed or special students may enter at any time provided there is laboratory room for them. They will not be rated in their work nor examined unless they make special request therefor. Work completed will be credited should the students subsequently enter the regular course.

#### EXAMINATIONS AND STANDINGS

Examinations are held at the end of the regular school year and during the last week of the first semester and are supplementary to the written tests and quizzes that are held at frequent intervals during the year, and with them form largely the basis of final determination of fitness for promotion or graduation.

Students are not required to write graduating theses, but instead they keep complete records of their laboratory work. The records are to be kept in substantially bound books, to be approved by the Faculty. The respective professors call for the records for inspection and rating once a month or oftener. Duplicates of records are to be furnished the College by the students. The college provides the paper.

The standing of students is determined by the results of recitations, written examinations, laboratory work, and attendance, and is indicated by the terms *excellent*, *good*, *passed*, *conditioned*, *incomplete*, or *failed*. Conditions may be removed as indicated below. Incomplete work must be made up before the final examinations of the following year.

In order to become eligible for final examinations students are required to attend at least four fifths of the lectures in each course. This rule is not intended for the benefit of those who seek admission after the opening of the college year, but is designed to cover cases of sickness or unavoidable absence. It does not apply to laboratory courses which must

be taken in full and must be entered during the first week in which they begin.

Students having conditions in more than two major or in more than three minor subjects of the first year can not enter upon the second year's work. All entrance conditions must be removed before the next spring examination. Candidates for graduation must have removed all conditions before entering upon the second semester of the graduating year.

Condition examinations are held during the first week of the course in September. The dates are usually posted in June. Conditioned students are required to inform themselves as to these dates as soon as they learn that they are conditioned, as no other notice is given. A fee of one dollar is charged for a second condition examination. Failure at the second condition examination obliges the student to repeat the work of the respective course. Students who carry a condition into a succeeding year may find a conflict of lecture or laboratory hours. In such cases they are to give preference to the lower course.

Absence will not be excused unless satisfactory reasons are given to the professor in charge. Habitual absence without a satisfactory excuse, continued indifference to study, or persistently poor scholarship may subject the student to temporary or permanent suspension. Students are earnestly requested to be present at the beginning of the school year, but those who can not enter in the fall may enter at the beginning of the second semester, taking any of the subjects beginning then. Any of the facilities afforded by the University are open to the students of this College, subject to the approval of the Dean. Opportunity is afforded to do advanced work in all branches. Textbooks may be obtained after coming to the University.

Students find their time fully occupied. Those who feel unable to complete the work of the regular course in two years may divide it in a manner to complete it in three years. Practicing pharmacists who desire to take certain branches of study may avail themselves of any of the college facilities.

#### COLLEGE TRAINING FOR PHARMACISTS

The recognition of the need of substantial college training for pharmacists finds expression in many ways. In New York, Pennsylvania, Hawaii, Wisconsin, Ohio, Louisiana, and Washington, such training is obligatory either by law or by rule of the boards of pharmacy. In a number of other states credit is given for college work. In Minnesota graduates from recognized colleges need to have had only two years of practical experience, while all others must have had four years of drug-store experience before they become eligible for examination by the State Board of Pharmacy for full license to practice in Minnesota. Graduates of the three-year course who have gained practical experience concurrently with their college work need only one additional year of drug-store experience before they become eligible for examination for full registration.

At the Joint Conference of the National Association of Boards of



Pharmacy and the American Conference of Pharmaceutical Faculties, held at Indianapolis, Indiana, in September, 1906, the following resolution was adopted:

"Special education for the practice of pharmacy is in this age a necessity and should as rapidly as possible be made compulsory. The rules of the boards of pharmacy are such as to promote and encourage it in all practicable ways. The special pharmaceutical education should include substantial laboratory courses." The training advocated by these two most representative bodies and by the American Pharmaceutical Association can be obtained only at colleges or schools of pharmacy of recognized standing. It is admitted that the State of Minnesota through its University College of Pharmacy is affording instruction of the most approved kind.

In the organization of this college the Board of Regents and the Faculty have had the coöperation of the pharmacists of the State. The character of instruction is of high order and every effort is made to comply with the demands of the profession of the Northwest, or elsewhere, in the maintenance of a course of instruction of the highest grade.

#### POSITIONS FOR GRADUATES

The demand for graduates of this College has always been greater than the supply and is continually growing. The rule is that practically all members of the senior class are engaged before graduation. This College is recognized in all states, including those in which standards of efficiency have been established.

#### STATE BOARD OF PHARMACY

The State Board of Pharmacy meets at the College four times each year to examine candidates for registration. For information concerning the board or state examinations, address the Secretary of the Board, Mr. E. A. Tupper, 721 South 10th St., Minneapolis, Minnesota.

#### COLLEGE OF PHARMACY ALUMNI ASSOCIATION

The Alumni Association of the College of Pharmacy meets annually, usually the day before Commencement. Every member of the Association is urgently requested to report change of address to the Secretary of the Association.

#### THE AMERICAN CONFERENCE OF PHARMACEUTICAL FACULTIES

The College of Pharmacy of the University of Minnesota is one of the colleges constituting the membership of the American Conference of Pharmaceutical Faculties.

#### PHI DELTA CHI

The Theta chapter of the Phi Delta Chi fraternity was organized at

the College of Pharmacy in 1904. Students of the College are eligible to membership.

THE NORTHWESTERN BRANCH OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

The Northwestern Branch of the American Pharmaceutical Association, composed of the representative pharmacists of the Northwest, has its headquarters at the College of Pharmacy. About four meetings are held annually. Students of pharmacy are eligible to membership in the Branch, but are privileged to attend the meetings without becoming members.

COMMUNICATIONS

Address communications to the Dean, Professor Frederick J. Wulling, University of Minnesota, Minneapolis, Minnesota.

## DEPARTMENTAL STATEMENTS

### BACTERIOLOGY

Professor H. E. ROBERTSON\*; Assistant Professor WINFORD P. LARSON;  
Instructors ARTHUR T. HENRICI, MARGARET WARWICK.

| COURSES |                           |         |            |                 |
|---------|---------------------------|---------|------------|-----------------|
| No.     | Title                     | Credits | Offered to | Prereq. courses |
| 5b.     | General Bacteriology..... | 5       | Sr.        | None            |

- 5b. GENERAL BACTERIOLOGY. The general scope of bacteriology, the history of its development, and the biological and chemical problems involved in the life-history of bacteria will be dealt with. General and special study of the various antiseptics, disinfectants, and bactericidal substances and conditions and the testing of various germicides—chemical and physical—and the use of bacteriological methods in the examination of drinking water and milk will form an important part of the work. ROBERTSON, LARSON, HENRICI, WARWICK.

### BOOK RESEARCH AND SEMINAR WORK

Throughout the year students are required to do book research and seminar work in the pharmaceutical library during certain hours released for the purpose from the pharmaceutical laboratory and other periods. Beginning with the coming year it is proposed to provide regularly in the College schedule two two-hour periods a week during the second semester of the graduating year for this kind of work. A room has been reserved for this purpose in the Pharmacy Building. To make this work of the utmost value the pharmaceutical library is being enlarged. During the past year about 1,800 additional volumes have been added.

### BOTANY AND MICROSCOPY

Professors FREDERIC E. CLEMENTS, CARL OTTO ROSENDAHL; Assistant Professors HERBERT F. BERGMAN, FREDERIC K. BUTTERS, NED L. HUFF; Assistant DONALD FOLSOM.

| COURSES |                      |         |            |                 |
|---------|----------------------|---------|------------|-----------------|
| No.     | Title                | Credits | Offered to | Prereq. courses |
| 17.     | General Botany.....  | 5       | Soph., jr. | None            |
| 18.     | Greenhouse Work..... | 1       | Soph., jr. | 17              |

17. GENERAL BOTANY. A study of the external forms of flowering

\*On leave of absence 1914-15.

plants with the relations, modifications, and functions of their several organs; special study of the flower with the outlines of the classification of flowering plants. Lectures, laboratory work, and field work. CLEMENTS, BUTTERS, ROSENDAHL, HUFF.

18. GREENHOUSE WORK. The facilities of the greenhouse applied in the study of outer morphology. BUTTERS.

## CHEMISTRY

Professors GEORGE B. FRANKFORTER, CHARLES F. SIDENER; Associate Professor E. P. HARDING; Assistant Professors IRA H. DERBY, WILLIAM H. HUNTER; Instructors WOLF KRITCHEVSKY, E. K. STRACHAN.

## COURSES

| No.      | Title                        | Credits | Offered to | Prereq. courses |
|----------|------------------------------|---------|------------|-----------------|
| 1.       | General Chemistry.....       | 5       | Soph., jr. | None            |
| 3.       | Qualitative Analysis.....    | 5       | Soph., jr. | 1               |
| 7.       | Quantitative Analysis.....   | 3       | Jr., sr.   | 3               |
| 111-112. | Organic Chemistry.....       | 10      | Jr., sr.   | 1 and 3         |
| 4.       | Water and Food Analysis..... | 3½      | Sr.        | 5               |

1. GENERAL CHEMISTRY. A study of the chemical properties of the non-metallic and the metallic elements. DERBY, STRACHAN.
3. QUALITATIVE ANALYSIS. This course covers the common reactions of the metals and acids and their qualitative separation. The ionic theory and the law of mass action are discussed with especial reference to qualitative reactions. DERBY, STRACHAN.
7. QUANTITATIVE CHEMISTRY. A study of the principles of gravimetric, volumetric, and gasometric estimation. SIDENER.
- 111-112. ORGANIC CHEMISTRY. This course includes work in both the aliphatic and aromatic series and the preparation of the more important compounds. FRANKFORTER, HUNTER.
4. WATER AND FOOD ANALYSIS. The chemistry of the atmosphere, water, soil, etc., the sanitary examination of air and water and the chemistry of foods are taken up in this course. FRANKFORTER, HARDING, KRITCHEVSKY.

## CLINICAL MICROSCOPY

Professor HAROLD E. ROBERTSON\*; Instructor JOHN E. HYNES.

## COURSES

| No. | Title                                | Credits | Offered to | Prereq. courses |
|-----|--------------------------------------|---------|------------|-----------------|
| 1.  | Clinical Chemistry and Microscopy... | 1       | Sr.        | None            |

1. CLINICAL CHEMISTRY AND MICROSCOPY. Includes (a) the macroscopic

\*On leave of absence 1914-15.

study of urine, its colors, sediments, and finer chemical tests and (b) the microscopic study of urine sediments, blood, pus, epithelial cells, casts, etc. ROBERTSON, HYNES.

## DISPENSARY PRESCRIPTION PRACTICE

Instructor OSCAR J. BLOSMO; Assistant JAMES L. TITUS.

| COURSES |                            |         |            |                 |
|---------|----------------------------|---------|------------|-----------------|
| No.     | Title                      | Credits | Offered to | Prereq. courses |
| 1-3.    | Prescription Practice..... | 2½      | Jr., sr.   | Pharm. 5        |

- 1-3. DISPENSARY PRESCRIPTION PRACTICE. The prescription dispensing for the Out-Patient Department of the University Hospitals is in charge of the College of Pharmacy. The senior students are sectioned into divisions of three or four for practical prescription work at the dispensary under the direction of Mr. Blosmo. The dispensary practice continues throughout the college year, afternoons from one to five. BLOSMO, TITUS.

## FIRST AIDS TO THE INJURED

Lecturer C. N. McCLoud and Assistant.

| COURSES |                      |         |            |                 |
|---------|----------------------|---------|------------|-----------------|
| No.     | Title                | Credits | Offered to | Prereq. courses |
| 2.      | Emergency Cases..... | ¾       | Jr., sr.   | None            |

2. EMERGENCY CASES. A series of twelve hour lectures and demonstrations designed to qualify the pharmacist to administer upon emergency cases before the arrival of the physician. McCLOUD.

## MATERIA MEDICA

PROFESSOR WULLING; Associate Professor E. L. NEWCOMB and Assistants.

| COURSES |                               |         |                 |                 |
|---------|-------------------------------|---------|-----------------|-----------------|
| No.     | Title                         | Credits | Offered to      | Prereq. courses |
| 1-2.    | Inorganic Materia Medica..... | 2       | Soph., jr.      | None            |
| 4-3.    | Organic Materia Medica.....   | 4       | Soph., jr., sr. | 1               |

- 1-2. INORGANIC MATERIA MEDICA. This course runs concurrently and in close relationship with Pharmacy 8 and 11. WULLING.
- 4-3. ORGANIC MATERIA MEDICA. The identity, sources, habitat, family, constituents, and preparations of the U. S. P., and of some unofficial vegetable drugs are studied in this course. NEWCOMB and Assistants.



PHARMACY

Professor WULLING; Assistant Professor GUSTAV BACHMAN; Instructors  
OSCAR J. BLOSMO, CHARLES H. ROGERS; Assistant E. E. TURNER.

COURSES

| No.    | Title                                                   | Credits | Offered to | Prereq. courses |
|--------|---------------------------------------------------------|---------|------------|-----------------|
| 1.     | History of Pharmacy.....                                | ½       | Soph., jr. | None            |
| 3.     | Metrology.....                                          | 3       | Soph., jr. | None            |
| 5.     | Physics of Pharmacy.....                                | 3       | Soph., jr. | 3               |
| 7.     | Pharmaceutical Processes.....                           | 3½      | Soph., jr. | 5               |
| 2.     | Pharmacopoeial Preparations.....                        | 5       | Soph., jr. | 7               |
| 4.     | Pharmacy Quiz.....                                      | 3       | Soph., jr. | 3, 5, 7, 2      |
| 6.     | Identification Inorganic U. S. P. Preparations.....     | 1       | Soph., jr. | 2               |
| 9.     | Pharmaceutical Chemical Philosophy                      | 1½      | Soph., jr. | None            |
| 11.    | The Pharmaceutical Chemistry of the Non-metals.....     | 1½      | Soph., jr. | 9               |
| 8.     | U. S. P. Inorganic Salts.....                           | 3       | Soph., jr. | 11              |
| 13.    | Classification of Pharmaceutical Organic Compounds..... | 1       | Jr., sr.   | 8               |
| 15-16. | U. S. P. Organic Compounds and Their Preparations.....  | 3       | Jr., sr.   | 13              |
| 17.    | Pharmacopoeial Qualitative Analysis.....                | 5       | Jr., sr.   | 11              |
| 18.    | Pharmacopoeial Quantitative Analysis.....               | 2       | Jr., sr.   | 17              |
| 19.    | Prescription Incompatibility.....                       | ½       | Jr., sr.   | 9, 13           |
| 21-22. | Prescription Dispensing.....                            | 12      | Jr., sr.   | 19, 2           |
| 23.    | Manufacture U. S. P. Salts.....                         | 4       | Jr., sr.   | 8               |
| 10.    | National Formulary.....                                 | 1       | Jr., sr.   | 23              |
| 12.    | Pharmaceutical Assay.....                               | 1½      | Jr., sr.   | 10              |
| 14.    | Synthetic Remedies.....                                 | ½       | Jr., sr.   | 15              |
| 16.    | Homeopathic Pharmacy.....                               | ½       | Jr., sr.   | 21              |
| 25-26. | Identification U. S. P. Salts.....                      | 1½      | Jr., sr.   | 8, 15           |
| 18.    | Microchemistry.....                                     |         |            |                 |
| 27-28. | Mathematics of Pharmacy.....                            | 1       | Soph., jr. | 3               |

1. HISTORY OF PHARMACY. This course embraces the study of the history of pharmacy, including the U. S. Pharmacopoeia through all of its revisions and the literature of pharmacy. WULLING.
3. METROLOGY. A critical study of weights and measures and balances; specific gravity, specific volume; alligation, etc. WULLING, ROGERS.
5. THE PHYSICS OF PHARMACY. This course covers a review and more extended elucidation of such divisions of physics as apply to pharmaceutical processes. WULLING, ROGERS, TURNER.
7. PHARMACEUTICAL PROCESSES. A study of the various laboratory processes employed in pharmaceutical manufacture. WULLING, BACHMAN, ROGERS, TURNER.
2. PHARMACOPOEIAL PREPARATIONS. This course includes the study and preparation of official bodies for which the Pharmacopoeia gives formulae and processes. WULLING, ROGERS, TURNER.

4. PHARMACY QUIZ. A thorough review of the work covered in Courses 3, 5, 7, and 2. BACHMAN, ROGERS.
6. IDENTIFICATION OF INORGANIC U. S. P. PREPARATIONS. The study of the appearance and physical properties of inorganic official preparations. BACHMAN, ROGERS, TURNER.
9. PHARMACEUTICAL CHEMICAL PHILOSOPHY. This course treats of the principles underlying chemistry and elucidates chemical facts and phenomena in their pharmaceutical aspects. WULLING.
11. THE PHARMACEUTICAL CHEMISTRY OF THE NON-METALS. A study of the description, properties, pharmacy, and manufacture of the non-metals used in pharmacy, including their U. S. P. preparations. WULLING.
8. U. S. P. INORGANIC SALTS. Especial reference to sources, description, properties, and manufacture. WULLING.
13. CLASSIFICATION OF PHARMACEUTICAL ORGANIC COMPOUNDS. A preparation for Pharmacy 15-16. WULLING, ROGERS.
- 15-16. U. S. P. ORGANIC COMPOUNDS AND THEIR PREPARATIONS. This course includes the critical study of cellulose and its derivatives, destructive distillation products, starches, sugars, fermentation products, organic acids, fixed oils and fats, volatile oils, waxes, and animal fats, alkaloids, glucosides, animal drugs and products, etc. WULLING, ROGERS.
17. PHARMACOPOEIAL QUALITATIVE ANALYSIS. A critical study of the identity, purity, limit, and percentage tests of the Pharmacopoeia and their application either wholly or in part to practically every official organic and inorganic salt and compound. BACHMAN, ROGERS, TURNER.
18. PHARMACOPOEIAL QUANTITATIVE ANALYSIS. This course includes the gravimetric, volumetric, and gasometric determinations of the U. S. Pharmacopoeia, but not pharmaceutical assay (12). WULLING, BACHMAN, ROGERS.
19. PRESCRIPTION INCOMPATIBILITY. Therapeutic, pharmaceutical, and chemical incompatibility is taken up in lecture and recitation work preliminary to Course 21-22. BACHMAN.
- 21-22. PRESCRIPTION DISPENSING. This course runs concurrently and in coöperation with Dispensary Prescription Practice 1, 3, and includes the critical study of the prescription and practical work in dispensing a wide range of prescriptions taken from actual medical practice. WULLING, BACHMAN, BLOSMO, TURNER.
23. MANUFACTURE OF U. S. P. SALTS. The preparation of about forty official salts included in this course. WULLING, BACHMAN, TURNER.

10. NATIONAL FORMULARY. This lecture and laboratory course includes a partial study of the National Formulary and the making of a number of its more important preparations. BACHMAN, TURNER.
12. PHARMACEUTICAL ASSAY. The quantitative determination of alkaloidal and other active constituents of a number of the potent organic drugs and preparations. WULLING, BACHMAN, TURNER.
14. SYNTHETIC REMEDIES. The study of the pharmaceutical chemistry of synthetic chemicals in medical use. WULLING, ROGERS.
16. HOMEOPATHIC PHARMACY. A brief exposition of the principles underlying the preparation of homeopathic remedies, including some laboratory work. WULLING, BACHMAN.
- 25-26. IDENTIFICATION OF U. S. P. SALTS. The study of the physical identity of the more important official inorganic and organic salts. BACHMAN, TURNER.
18. MICROCHEMISTRY. Work in the microchemistry of pharmacy is included in the work of a number of other courses, but will soon be offered as a separate course. WULLING, BACHMAN, NEWCOMB, ROGERS.
- 27-28. MATHEMATICS OF PHARMACY. While students are required to have a preparation in arithmetic, algebra, and geometry before entering, they receive frequent drills throughout the year. Students are required to take final examinations in the subject at the end of the first and second year. WULLING, BACHMAN, BLOSMO, ROGERS.

## PHARMACEUTICAL JURISPRUDENCE.

Professor F. J. WULLING.

### COURSES

| No. | Title                        | Credits       | Offered to | Prereq. courses |
|-----|------------------------------|---------------|------------|-----------------|
| 2.  | Law for Pharmacists.....     | $\frac{2}{3}$ | Jr., sr.   | None            |
| 4.  | Minnesota Pharmacy Laws..... | $\frac{1}{3}$ | Jr., sr.   | None            |

2. LAW FOR PHARMACISTS. The lectures introduce the subjects of contracts, agency, commercial paper, insurance, etc., in their application to the practice of pharmacy and discuss the liability of retail pharmacists. WULLING.
4. MINNESOTA PHARMACY LAWS. The study of the laws of Minnesota affecting the practice of pharmacy. The lectures are given by special lecturers experienced in the application and operation of the state pharmacy laws.

## PHARMACEUTICAL MINERALOGY AND CRYSTALLOGRAPHY

Assistant Professor FRANK F. GROUT and Assistant.

| COURSES |                      |         |            |                 |
|---------|----------------------|---------|------------|-----------------|
| No.     | Title                | Credits | Offered to | Prereq. courses |
| 24.     | Mineralogy.....      | 1       | Sr., grad. | None            |
| 66.     | Crystallography..... | 1       | Sr., grad. | 24              |

24. MINERALOGY. A study of the occurrence and properties of minerals of pharmaceutical importance; ores of metals used in pharmacy; non-metallic minerals and mineral waters in their mineralogic and geologic relations. GROUT.
66. CRYSTALLOGRAPHY. A survey of form and more evident physical characters as a basis for practice in sight recognition of economic minerals and their distinction from common rocks. GROUT.

## PHARMACOGNOSY

Associate Professor EDWIN L. NEWCOMB and Assistant.

| COURSES |                            |         |            |                 |
|---------|----------------------------|---------|------------|-----------------|
| No.     | Title                      | Credits | Offered to | Prereq. courses |
| 1.      | Medicinal Plant Study..... | 4       | Soph., jr. | None            |
| 3.      | The Cryptogams.....        |         | Soph., jr. | 1               |
| 5-6.    | Pharmaco-histology.....    |         | Soph., jr. | 3, Mat. Med. 4  |
| 9.      | Drug Collection.....       | 10      | Jr., sr.   | 5               |
| 11-12.  | The Angiosperms.....       |         | Jr., sr.   | 5               |
| 2.      | Field Work.....            |         | Jr., sr.   | 1               |

1. MEDICINAL PLANT STUDY AND DRUG PREPARATION. The principles underlying the preparation of plant drugs, including the study of plants cultivated in the medicinal plant garden, and herbarium work. NEWCOMB and Assistant.
3. THE PHARMACOGNOSY OF THE CRYPTOGAMS. In this course some of the drugs and economic products obtained from the cryptogams are studied. NEWCOMB and Assistant.
- 5-6. PHARMACO-HISTOLOGY. Includes the micrometry and the detailed study of the inner structure of parts of the higher plants as illustrated by about forty official and unofficial drugs. NEWCOMB and Assistant.
9. DRUG COLLECTION AND PREPARATION. Scientific methods of drug collection and preparation of about fifty drugs from plants grown in the medicinal plant garden. NEWCOMB and Assistant.
- 11-12. PHARMACOGNOSY OF THE ANGIOSPERMS. This course includes the scientific study both macroscopically and microscopically of the official seeds, roots, rhizomes, barks, woods, pith, flowers, fruits, leaves, herbs, exudations, and other plant products, and animal drugs and animal

fibers. The more important vegetable drugs occurring in the powdered form are examined and studied microscopically. Adulterants of powdered drugs and their detection are given much attention. NEWCOMB and Assistant.

2. FIELD WORK. At suitable times the classes are taken on field excursions to search for native medicinal plants. The study of the distinguishing characteristics of certain orders, families, and genera to which the medicinal plants belong is included in this work. NEWCOMB.

## PHYSIOLOGY

Associate Professors RICHARD OLDING BEARD, FREDERICK H. SCOTT; Instructor C. J. V. PETTIBONE.

## COURSES

| No. | Title                      | Credits | Offered to | Prereq. courses |
|-----|----------------------------|---------|------------|-----------------|
| 1.  | Physiology.....            | 1       | Jr., sr.   | None            |
| 2.  | Urinalysis.....            | 1       | Jr., sr.   | 1               |
| 4.  | Physiologic Chemistry..... | 4       | Jr., sr.   | 1               |

1. PHYSIOLOGY. The work covers the study of the physiological properties of the cell, the nutritive media, the nervous mechanisms in general, muscular tissues, connective tissues, and epithelial tissues. The subjects of anatomy and histology are touched upon sufficiently to lay the foundation for the proper understanding of physiological functions. Special attention is directed to the action of drugs and their effects upon the various systems. BEARD, SCOTT, PETTIBONE.
2. URINALYSIS, QUALITATIVE AND QUANTITATIVE (Postgraduate). Lectures, recitations, and laboratory work. The laboratory work includes the qualitative analysis of representative specimens of urine as regards their physical properties, inorganic and organic constituents, as well as the quantitative determination of chlorides, urea, ammonia, total nitrogen, sugar and albumin, together with the preparation of reagents. BEARD, SCOTT.
4. PHYSIOLOGIC CHEMISTRY (Postgraduate). Laboratory work and demonstrations. A practical study of the several classes of proteids, carbohydrates, fats, muscle, and bone; of gastric juice, saliva, pancreatic juice, and bile in their respective digestions; of glycogen, and of blood lymph, chyle, and milk. Practical instruction is given in the enumeration of blood cells, in the estimation of haemoglobin and of the corpuscles in mass, in the spectroscopic examination of the blood in the determination of blood tests and in the use of polariscope. BEARD, SCOTT.



## THERAPEUTICS AND TOXICOLOGY

Associate Professor EDGAR D. BROWN.

| COURSES |                                  |         |            |                                            |
|---------|----------------------------------|---------|------------|--------------------------------------------|
| No.     | Title                            | Credits | Offered to | Prereq. courses                            |
| 2.      | Therapeutics and Toxicology..... | 1       | Jr., sr.   | Pharmacognosy<br>11 and 12;<br>Mat. Med. 1 |

2. THERAPEUTICS AND TOXICOLOGY. In this course drugs are studied in groups as governed by their medical properties and the therapeutic features of such groups are described. Remedial measures other than those depending upon drugs are fully considered. The effects upon the system of poisons and of poisonous doses of drugs also receive consideration. BROWN.



